I. Waldburg

THE SOUTHERN AGRICULTURIST,

HORTICULTURIST,

AND

REGISTER OF RURAL AFFAIRS.

ADAPTED TO THE

Southern Section of the United States.

NEW SERIES.

VOL. 2—NO. V.

MAY, 1842.

EDITED BY J. D. LEGARE.

MONTHLY.

CHARLESTON, S. C.

PUBLISHED BY A. E. MILLER,

95 BROAD-STREET.

Five Dollars a Year,

IN ADVANCE.

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AGRICULTURE.

HORTICULTURE.

MISCELLANEOUS.

THE SOUTHERN AGRICULTURIST.

(NEW SERIES.)

Vol. II. **FOR MAY, 1842.** **No. 5.**

For the Southern Agriculturist.

REMARKS ON THE CULTURE OF INDIAN CORN, IN REPLY TO THE EDITOR OF THE CULTIVATOR.

To the Editor of the Southern Agriculturist:

Dear Sir,—In looking over the first and second volumes of the Cultivator, my attention was particularly attracted by the following editorial remarks on the subject of Indian Corn and its culture: namely: "The roots grow to as great a length as the stalks;" and "In Corn ground we think six to nine inches a suitable depth" in ploughing, as "The roots will strike fully to this depth if there is food for them."

Now, as there could be nothing more absurd than to maintain that a plant, five to ten feet high, has roots as long as itself, and that these roots go down perpendicularly, and yet reach no lower than eight or nine inches below the surface; the conclusion is obvious, that the Editor believed in the horizontal distribution of the roots of Corn as a general rule. Having had no opportunity of ascertaining, from personal observations, what the fact on this point is, in the soil and climate of that latitude; I notice this opinion of the Cultivator, not for the purpose of denying its correctness in so far as it may apply to that section of the Union; but to shew, that however well founded there, it is not altogether in accordance with facts here. And with this view, I shall state the general results of examinations of this plant, repeatedly made, in order to satisfy my own mind on this point.

It is not intended, here to deny the existence of horizontal roots to the Corn plant, (a fact with which every planter is no doubt familiar); but to call attention to the no less important fact, that these roots, however indispensable may be their functions, are not the principal in size, but are given off from other and much larger roots, which go down perpendicularly or nearly so, to a depth, under favorable circumstances, of several feet.

The plants first examined, grew in a very light sandy soil, incumbent on a loose subsoil of yellow and white sand many feet deep. Here, upon carefully removing the earth to the depth of two feet, all the large roots were found running down perpendicularly; or at least so nearly so, as to be embraced in a circle of eighteen or twenty inches diameter, at a depth of two feet below the surface. More surprised at first, than satisfied with this discovery, I exami-

ned a number of other plants in the same manner, but with the same result; and was, of course, compelled to abandon the opinion previously entertained, that the main roots of the Corn plant were all horizontal. These plants averaged about twenty five perpendicular roots, some of which were traced two feet nine inches, when they were snapped off; and, upon comparing their diameter where broken off with that a foot above this point, it was evident they must have penetrated at least a foot deeper, making their entire length not less than three and a half to four feet. It should be remarked, however, that occasionally one of these large roots was found so bent in its course as to run parallel with the surface: and further, that in one or two plants the majority of the roots diverged at such an angle, that they could not be strictly considered either perpendicular or horizontal. But these were plainly mere exceptions to the general rule. With regard to the horizontal or lateral roots, it was observed that the degree of their development seemed to depend mainly on the condition of the soil, (properly so called), and the season. Where the former was poor and the latter dry, but few of them, apparently, exceeded two or three inches in length, while many were much shorter. On the other hand, where the soil had been made very rich by high manuring, more especially if a wet season concurred, these roots were very much increased, not only in numbers but in all their dimensions, a large proportion of them extending from one to two feet or more from the stalk. All other things being the same then, these roots (the lateral) would seem to be developed, on the one hand, in proportion to the fertility of the soil; and on the other, to the degree of humidity of the season; attaining their utmost size under a concurrence of wet seasons and high manuring, and their least under the opposite contingency. There appear to be good grounds for believing, too, that wherever circumstances favor the growth of one of these classes of roots, that of the other is correspondingly retarded.

With a view to ascertain whether or not this disposition of the roots of the Corn plant were affected by the texture of the soil and subsoil, several plants were next examined, growing in a close and heavy soil, based on a stiff subsoil, consisting principally of clay with some sand. But here also, the same law was found operating in giving a downward tendency to the main roots. They were observed, however, to be more numerous, and to reach an average depth of only two feet, their progress downwards being no doubt obstructed by the resisting quality of the subsoil. The horizontal roots, though of smaller diameter than the perpendicular, were so much more developed than in the former case, especially when favored by a moist and mellow soil, as to traverse and occupy the entire intervals (a space of five feet) between the rows.

The results of the above examinations certainly go to show, then, that the opinion of the Cultivator is not in strict harmony with facts, at least in this locality: that, in short, the principal roots of

the plant under consideration, so far from penetrating only eight or nine inches below the surface, actually reach a depth of several feet: while the horizontal, which that Journal seems to regard as the principal roots, are, in point of fact, smaller (though often longer) ones given off from the former. It has been seen, moreover, that the relative dimensions of these two sets or classes of roots are not always the same; their respective developments depending, as they do, on the controlling influence of the several ever varying causes enumerated.

We cannot reflect on the foregoing facts, without at once perceiving and in some degree, appreciating, their practical bearing. Nor can any one acquainted with the habits of this plant, fail to discover the wise adaptation of means to the end displayed in the number and position of its larger roots. One happy and very obvious effect of this arrangement is, a degree of exemption from the effects of drought, which could not be enjoyed under any other. Hence it is that Corn, although so susceptible of injury from this cause, does not suffer more from it. For it cannot be questioned that, with its present physiological constitution unchanged, the harm it would sustain would be much greater were its roots horizontally placed, and of course, near the surface. Indeed this fancied position of its roots can never sufficiently account for the readiness with which this plant suffers from drought. This phenomenon, is clearly referable to nothing else than the organization of the entire plant itself. The most obvious of its features—its size, the well known porous structure of its stalk and leaves—its rapid foliar transpiration, &c., sufficiently indicate the need of a quantity of sap both absolutely and relatively large. Now, as water is essential to the formation of sap, and constitutes such a large proportion of it, it would seem evident, that this plant, which contains so much sap, must require a corresponding quantity of water, and must suffer sooner for the want of it, than if its relative proportion of sap were much less.

Indulge me here, Mr. Editor, with a remark or two on this point relatively to the Cotton plant. Its capability of resisting drought has been attributed, in a published communication, to its tap-root. This it is supposed, by penetrating to a great depth, furnishes a supply of moisture sufficient to enable it to withstand a drought, by which Corn would be seriously injured if not destroyed. In order to determine the truth in this matter, I have pulled up and examined a great many plants after the 15th or 20th of July; but have found a large proportion of them with no tap-root at all: while in others this root had either assumed a lateral direction, or had become so diminutive in size, and inferior to the lateral, as to be evidently incapable of the effect above ascribed to it. Yet these plants were as little affected by drought and as productive as the tap-rooted. Now if the latter resist drought by virtue of their tap-roots, by virtue of what do the non-tap-rooted plants resist it? Were it this root alone that conferred immunity from the effects of

a dry season, one might expect during such a time easily to distinguish between them while growing; but this, it is believed, cannot be done; and it is more than probable that the relation of this plant to the season is as little controlled by its tap-root, as that of the Corn plant is by its horizontal roots. The former—whatever may be its degree of succulency, becomes gradually more and more woody, until at maturity, it acquires the closeness of texture and hardness of many shrubs. While, on the other hand, the stalk of the latter is more or less occupied by a pith so filled with sap, that it may be wrung from it almost as water from a saturated sponge. Were equal portions, by bulk, of Cotton and Corn-stalk, at the same period of their growth, deprived of their sap, the quantity from the former would doubtless be much less than that from the latter: for the very obvious reason, that the dense and compact structure of the one, is incompatible with that capacity for sap existing in the very light and porous pith of the other. Hence it would seem safe to conclude, that Cotton, containing, as it does, less sap, requires less moisture than Corn; and is, of course, better able to sustain itself during drought, even supposing the relative activity of the leaves to be the same in both plants. This opinion is corroborated by the effects of the great drought of 1839 on some of our forest trees situated in certain high and thirsty localities. The oaks so far as I observed, exhibited no evident symptoms of injury, while the pines growing among them, lost in some instances, a moiety of their leaves. Here then the case of the Cotton and Corn is reversed; the tap-rooted plant suffering least in one case, and most in the other. This, it is conceived, can only be explained by reference to a difference of organization: the result of which was, that the pine, though fortified by an immense tap-root, became the earlier and greater sufferer.

But to return. Another view of this part of our rooty subject still further confirmatory of the above opinion is this. We have seen that the Corn plant has numerous perpendicular roots (I have counted from 20 to 60) going down at least as deeply as the Cotton tap-roots, and equivalent on an average, to not less than three or four of the latter. If then the latter plant can, by the aid of its *single* tap-root, so effectively resist drought, why should not Corn even more so?

There is another point legitimately connected with this subject, which may be here properly remarked upon. I allude to the burning or firing of Corn. It is *possible* that this may occur in all seasons and soils; and under every kind of management; whether as regards the time or method of planting, the distance between the rows and hills, or the subsequent culture. Where it happens from the nearness of the plants to each other (as in standing Corn), much stress has been laid on a deficient circulation of air as the immediate cause. That the atmosphere is an agent of indispensable importance to vegetable, as well as animal life, no one will deny; but that the want of it is the cause of firing is not so very obvious.

Indeed it is almost inconceivable that our corn-fields, which are so constantly swept by winds from the zephyr to the gale, can suffer in this way from a stagnation or deficiency of air. This opinion no doubt took its origin from the very apparent difference between close Corn and that which has a wide or open stand; the former firing, while the latter remains green and luxuriant. But it is believed that correct observation will sustain the assertion, that the fresh and vigorous appearance of the latter is not owing to its having more air, but to its having more food, than the former. The plants being here few in number and far apart, obtain the sole benefit of the nourishment within reach of their roots, and flourish accordingly: on the same principle that 20 head of cattle will thrive and fatten on a pasture, where 80 or 100 will barely live, or perhaps, even starve to death. Firing, it is more than probable, is always an indication of a deficient supply of nutriment. This may result from sheer poverty of soil; from the too long presence of grass, weeds, &c., from having too many plants in the hills, or these too near; from a deficiency or redundance of water, (both equally cutting off the supply of food; the one operating through the withdrawal of the only menstruum, which holds the food of plants in solution, in which state alone it can be taken up by the roots; and the other, by excluding the influence of the atmosphere, and thus preventing those changes, which the crude materials in the soil must undergo in order to prepare them for the purposes of nutrition); and lastly, from work injudiciously timed, or improperly executed, which, by breaking off many of the roots, lessens the usual and requisite quantity of food, and of course, causes the plants to fire; or in other words, to starve. There is a striking analogy between the vegetable and animal kingdoms. In both food and air are alike essential. And we may as well propose to raise fine animals, as to make large crops on a *plenty of air* and a scanty allowance of food.

But, Sir, it were certainly an unwarrantable trespass on the reader's time, and an unprofitable appropriation of your pages, to occupy either in the discussion of subjects that are of no practical utility. Believing, however, that such is not the case in the present instance, I shall briefly notice one or two conclusions fairly deducible from what has been already stated. And the first of these is, a difference in the manner of applying manure, suggested by the difference, in size, between the lateral roots growing in a tenacious and heavy soil; and those growing in a loose and sandy soil. On the principle (undoubtedly a correct one), that plants, in order to do well, should be furnished with fresh food at every period of their growth, until maturity; it is evident, that, in the first case, when the roots attain such length as to occupy the whole space between the rows, the manure should be incorporated with the entire soil: for it is no less evident, that if, in neglect of this principle, it be placed immediately around the plants, so that the roots soon extend beyond it, injury must eventually follow, and that at a most

critical time—to wit, the filling out of the grain. On the other hand where the roots are only a few inches long, as in the second variety of soil, manure, if scarce, may no doubt be advantageously economized by applying it to the hill about a foot in all directions from the centre. But it must not be forgotten here, that, even in soil of this description, the roots in question will extend themselves several feet; provided the season be wet and the entire ground highly manured. Hence it is concluded, that the mode of applying manure in this case should (if practicable) be the same as in the other.

But if these observations go to prove the necessity of fertilizing, they tend no less to shew the importance of deepening the soil. It is by no means intended here to disparage superficial or surface manuring: or even to affirm that it is not decidedly the best. But if it be a sound position that manures should be so applied that all the roots will, at every moment of their extension, acquire fresh food; and if it be so that roots are attracted and developed as already shewn; and if it be farther true that the vigor and productiveness of Corn plants are commensurate with the size and number of their roots; then the advantages of deep manuring are at once evident. This is conspicuously the case in a dry season and thirsty soil. Under these circumstances, the roots, by penetrating to a considerable depth, find food and moisture sufficient to sustain a crop in a thriving state, which would be almost, or perhaps totally, destroyed, were the soil (though equally fertile) of only one third or one fourth the depth. But the importance of atmospheric and solar influence should not be lost sight of while adding to the depth of the soil. Hence this process should be carried on consistently with that degree of looseness or mellowness necessary for the admission of air, &c., to the roots. Daily observation attests the fact, that these qualities—richness, depth, and mellowness—conferred on the soil, constitute its best safeguards against the effects of drought.

At this point, however, my limits compel me to relinquish the further consideration of this subject; and to leave practical details to other and more competent hands.

In conclusion, Mr. Editor, these remarks are submitted to your better judgment, to be disposed of in whatever way you may deem best. Convinced that the propagation of error can never promote the cause of Agriculture, and that success must, in the very nature of things, depend, not in things taken for granted, but on well ascertained truths; I have been induced merely to call attention to a fact, which seems to have been overlooked by the Cultivator, and perhaps others; and to hint at one or two important principles, which should guide one in preparing for this crop, leaving the feasibility of carrying them out into practice to be determined by those most interested.

Very respectfully,
Your obedient servant,
L. REEVE SAMS, M. D.

LECTURES ON AGRIGULTURE.

Three Lectures on Agriculture, delivered at Oxford, on July 22nd and Nov. 25th, 1840; and on Jan. 26th, 1841; in which the Chemical Operation of Manures is particularly considered, and the Scientific Principles explained, upon which their efficacy appears to depend. By Charles Daubeny, M. D., F. R. S., M. R. I. A., &c., Sibthorpian Professor of Rural Economy in the University of Oxford. Oxford, 1841. 8 vo., pp. 106.

(Continued from page 176.)

"But it would seem necessary to attribute to the living vegetable the power of decomposing, not merely carbonic acid, but also water.

"This indeed has been shown, by M. Colin and Edwards in their experiments on the respiration of plants, and likewise by M. Boussingault; nor can we otherwise account for the fact, that wax, risen, and several other vegetable products, contained an excess of hydrogen, over and above that required to constitute water with the oxygen present.

"It would seem I think, from the late important researches of M. Payen, that the decomposition of water commences subsequently to that of carbonic acid, whether it be that the former process requires a greater development and energy in the vegetable functions, or that it takes place in organs of a different description and of later growth.

"M. Payen seems to have established, that under the general term of ligneous fibres, or lignin, we have hitherto confounded at least two distinct substances, namely, that which constitutes the walls of the cells, and that which by being deposited afterwards on the surfaces of the latter, imparts to them the solidity of texture which woody fibres posesses.

"He has succeeded in isolating the two by chemical means, and has found, that whilst the cellular matter has exactly the same composition as starch, being composed of 44.9 carbon, 6.1 hydrogen, 49 oxygen, or 44.9 carbon, and 55.1 of water; the incrusting matter afterwards formed consist of 53. 76 carbon, 40. 2 oxygen, and 6 of hydrogen, or of 53. 76 carbon, 45 of water, and 1 of hydrogen.*

"The composition of the ligneous matter of different kinds of wood will therefore vary according to the relative proportion of these two ingredients, as is shown in the following table of M. Payen:—

* Payen has since stated, that this incrusting matter probably consists of two or three different principles.

LIGNEOUS BODIES.	Carbon.	Hydrogen.	Oxygen.	Incrusting Matter.
Incrusting matter of the wood	53.76	6 00	40.20	100
Wood of St. Lucia	52.90	6.07	41.03	90
Ebony	52.85	6.00	41.15	89
Walnut	51.92	5.96	42.12	82
Oak	50.90	6 20	42.80	61
Ditto, according to Gay-Lussac and Thenard	51.45	5 82	42.73	
Beech	49.25	6.10	44.65	52
Cellular matter	44.90	6 10	49.00	00

"This, then, proves that, in the formation of the matter which incrusts and fortifies the walls of the cullular tissue in wood, though not in that of the cullular tissue itself, a decomposition of water must have taken place; since the 1 per cent. of hydrogen which Payen has found in excess, can only have arisen in this manner.

"This increase of hydrogen becomes still greater, when, in the progress of vegetation, the plant begins to secrete oils, camphors, and other analogous bodies, products which, it is to be remarked, abound most within the tropics, where the light of the sun is most intense.

"Hence the decomposition of water, no less than that of carbonic acid, seems due to solar influence, and, accordingly, the greater sweetness of subacid fruits in a warm than in a cold summer, arises from the tranformation of a larger amount of tartaric or other vegetable acid into sugar, owing to that separation of oxygen from the former, which is accomplished by the agency of light.

"The process of assimilation of plants in its most simple form, may therefore be stated as consisting in the extrication of hydrogen from water, and of carbon from carbonic acid, in consequence of which one or three things must happen—either all the oxygen of the water and of the carbonic acid are separated as in those bodies which, like caoutchouc, volatile oils, &c. consist of nothing else but carbon and hydrogen; or, secondly, only a part of it is exhaled, as in the cause of the incrusting matter of wood, and sugar; or, thirdly, that belonging to the carbonic acid alone is decomposed, whilst the water remains, as in starch and cellular tissue.

"But there is yet another ingredient which is present, although generally in minute proportions, in many vegetable principles, and which therefore must be furnished to them from without, in order that their remaining constituents may become assimilated; for it is evident that however small the amount of any one of the component parts of a compound may be, still its presence is just as essential as that of the rest.

"This ingredient is nitrogen, which exists in the seeds of most plants, and seems essential to all those vegetable principles that afford the staple from which animal life obtains its support.

"The dependence of the nutritive qualities of various articles of food upon the proportion of nitrogen, is well shown in a recent

memoir of Monsieur Boussingault,* who gives, on the authority of the celebrated agriculturist, Von Thaer, a scale of the relative degree of nutriment afforded by various plants to cattle, and then places by the side of it a statement of the proportion of azote present in them; from which it appears that the nutritious quality of each bears a pretty constant ratio to the quantity of nitrogen they contain.

"This may be seen the following table:—

	Equio.		
Ordinary hay	100,	its azote being	0.0118
Red clover	90	.....	0.0176
Beans	83	.....	0.0141
Wheat straw	400	.....	0.0020
Potatoes	200	.....	0.0037
Beet	397	.....	0.0026
Maize	59	.....	0.0164
Barley	54	.....	0.0176
Wheat	27	.....	0.0213

"When we reflect, indeed, that animal matter, which so abounds in nitrogen, is nevertheless derived, either directly or indirectly, from vegetable, it follows, as a necessary consequence, that existence can only be maintained by the aid of those principles in plants, which contain a certain proportion of the element alluded to.

"And this has been shown by the experiments of Magendie upon dogs, who were fed on sugar, starch, gum, and other substances destitute of nitrogen, and in a very short time pined away and died.

"Now, in inquiring as to the source from which plants derive their nitrogen, it might at first sight strike us, that the atmosphere itself, which contains as much as 80 per cent. of this gas, would supply it. To this supposition, however, there appear to be grave objections, from the indisposition which nitrogen evinces to enter into combination with any elementary substances, excepting oxygen and hydrogen. With the latter, indeed, it is only when in what is called a *nascent* state that it will unite; nor do bodies containing either hydrogen or oxygen in combination exert for it the smallest affinity.

"Liebig, therefore, concludes that it is furnished to plants by the decomposition of ammonia, a compound of nitrogen with hydrogen, which forms its solubility in water and in acids, together with the facility with which it is resolved into various opposite forms, seems exactly calculated to enter into the vegetable organization, and to supply the nitrogen which it requires.

"But is ammonia so uniformly present wherever plants are to be found, as the foregoing explanation appears to assume?

"Considering that this gas is the constant result of animal decomposition, its presence in recently-manured soil, or even generally

* Annales de Chemie, vol. lxiii.

near the great resorts of man, may perhaps be readily conceded; but are we authorized to regard it as the source of nitrogen in plants, that grow in places remote from human habitation, where decaying animal matter cannot so constantly present itself?

"This question, which had embarrassed all those who formerly indulged in speculations on the subject, seems at length to have been set at rest by the researches of Liebig.

"'Experiments made,' he says, 'in his laboratory at Giessen, with the greatest care and exactness, have placed the presence of ammonia in rain water beyond all doubt. It had hitherto escaped observation, merely because no one thought of searching for it.' All the rain water which he examined was collected 600 paces west of Geissen, whilst the wind was blowing towards the town in that direction. It could not therefore have been derived from any animal exhalations proceeding from that source. When several hundred pounds of this water were distilled in a copper still, and the first two or three pounds that came over had been evaporated with the addition of a little muriatic acid, very distinct crystals of sal-ammoniac were obtained.

"Hence there can be no doubt, that ammonia must be constantly present combined probably with carbonic acid, in the atmosphere we breathe, although in quantities too minute to be appreciable.

"Its amount, as inferred from the indications afforded by the rain or snow water that has been examined, appears to be very variable, being greater in summer than in winter, during long protracted drought than after a continuance of wet; but this is no more than might be expected, when we reflect that it must be principally derived from the decomposition proceeding in various parts of the globe of all kinds of animal exuviæ, the volatile products of which, until otherwise appropriated, will be retained in the general body of the atmosphere, as in a common reservoir.

"Thus ammonia will be constantly presented to the roots of plants in union with the rain water that has descended from the heavens, even where the vegetable mould is so entirely destitute of animal matter as to be incapable itself of supplying it.

"There is also another principle which may be called in, to explain the manner in which gaseous matters are brought into contact with the absorbing surfaces of plants.

"It was originally shown by Saussure, that charcoal has the property of absorbing and even condensing within its pores various gaseous matters; and Faraday observed, not many years ago, the singular facility with which earthy and metallic powders of all descriptions absorbed ammonia, when present either in the air, or in the bodies with which they are brought into contact.

"Reasoning upon these facts, I was myself led last spring to undertake a few experimenis, with the view of ascertaining whether vegetable mould had not the same property; and I found, accordingly, that both carbonic acid and ammoniacal gases were condensed

within its pores, as they would be within those of a lump of charcoal.

"Liebig in his late volume has made the same remark, and has extended it to the oxides of iron, to pipe-clay, &c.; and hence we have a mode of accounting for the absorption of ammonia by plants, even in countries where the absence or rare occurrence of rain might otherwise deprive them of a due supply of this necessary ingredient.

"Nor are we any longer at a loss to trace the ammonia into the substance of the plant, which derives from it its nitrogen.

"That it does actually find its way into the vegetable organization we are assured by the researches of Professor Liebig, who ascertained that the saccharine juice which flows from the different varieties of the maple, even when growing in soils that were not manured, contains a large proportion of ammonia.

"The same is the case with the juice extracted from beet-root for the purpose of preparing sugar; and the products of the distillation of herbs, flowers and roots with water containing ammoniacal salts.

"So does also the juice of the fresh tobacco leaf, and that which exudes from the vine when an incision is made into it during the period that the sap is flowing.

"Its occurrence, in short, in the juices of plants seems not less certain than its existence in the atmosphere; and there can be little doubt that it is the decomposition of this compound which mainly supplies the nitrogen present in the constitution of organic bodies.

"It may be inferred, however, from some experiments made by Boussingault, that a great difference exists between plants in their power of assimilating nitrogen; and to this difference that chemist is disposed to attribute the advantage of alternately growing what are called fallow crops, for the purpose of refreshing the soil.

"'During germination,' he remarks, 'the quantity of azote which seeds contain appears to be on the increase, but there is this curious difference between different kinds, that whilst those of leguminous plants, sown in pure earth and moistened with nothing but distilled water, obtained an increase of nitrogen which the atmosphere alone could have afforded, those of barley and other cerealia remained, in that respect, stationary unless manure were afforded.'

"Boussingault also shows, in a subsequent memoir, that peas, clover, and other legumes absorb azote even when planted in a soil that contains no decomposing animal or vegetable matter, but that the cerealia, although if so placed they may grow, do not appear to secrete this principle.

"Boussingault, however, does not go so far as to maintain that the latter, in no stage of their existence, are capable of discharging this function, but only that the plant must have already arrived at a higher state of vigor in order to derive its supply from such a source.

"It is on the same principle that although the animal in general obtains its food from the various organic bodies on which he subsists, yet that, in an early stage of existence, before his organs are fitted for undergoing the labor of assimilating such materials, nature has provided him, in his mother's milk, with aliment already almost elaborated.

"It is thus, too, that in the seed the embryo is surrounded with a mass of albumen, from which it derives its support until its roots become sufficiently vigorous to extract nourishment from the ground.

"Hence it becomes, in most cases, necessary that crops cultivated as articles of food should have access to vegetable or animal manure from which they may derive their azote; but as this supply would soon be exhausted were it not at the same time regenerated from the atmosphere, we see the advantage of intercalating a green fallow crop ploughed into the ground with others, as leguminous plants, according to the experiments of Boussingault, have the greatest power of absorbing nitrogen from the air.

"On the same principle this chemist suggests the introduction of the Jerusalem artichoke into light soils, which, owing to the entire absence of mould, appear irreclaimably barren; this vegetable, the tubers of which afford nourishment to cattle almost equal to potatoes, having great power of absorbing both carbon and nitrogen from the air, and thus, by degrees, generating a certain amount of soil.

"I have seen this vegetable very commonly cultivated, for the use of cattle, in the light lands of the Grand Duchy of Baden and in certain parts of Alsace.

"But if it be true, as Liebig has endeavored to establish, that plants obtain everything except their alkaline and earthy constituents from the atmosphere, what, it may be asked, becomes of the theory of which mention was made in the preceding lecture, that attributes the unfitness of a soil for yielding several successive crops of the same plant to the excretions given out by its roots?

"For if plants receive the whole of their volatilizable ingredients from the atmosphere, these excrementitious matters, being composed chiefly of carbon, hydrogen, and oxygen, will not be absorbed, and therefore cannot affect the succeeding vegetation.

"The above inference would seem unavoidable, if it were considered absolutely proved, that nothing but the fixed ingredients of a plant were derived from the earth; but this is not fully established even with respect to the humus, much less with respect to the more soluble matters which the soil contains.

"These latter, there seems no reason for doubting, may be taken up by the spongioles of the roots dissolved in water, together with the alkaline and earthy ingredients which are derived from the soil; nor am I aware of any proof that they may not likewise be assimilated when so introduced.

"The theory of M. DeCandolle, therefore, is not affected by the above experiments, but must rest on its own merits, and continue to afford a subject for inquiry to the scientific agriculturist.

"And now, having laid before you what is at present known with respect to the sources from which plants obtain their several constituents, I ought to proceed in the next place to those practical inferences which appear deducible from the above general considerations—the time, however, that has been already consumed in the previous discussions, warns me that this portion of the subject must be for the present deferred, and that the completion of my original design will afford abundant materials for another lecture, in the series of those which, in compliance with the injunctions of the founder of the professorsqip of rural economy, I am called upon to deliver."

(To be continued.)

For the Southern Agriculturist.

RIVER BUNCH COTTON, &c.

Mount Pleasant, (Barnwell District,) April 20th, 1842.

My Dear Sir,—Having procured a few of the seeds of the Mangel Wortzel, and also of the Buckwheat, I am desirous of ascertaining the most suitable time for putting the seed in the ground.* Having never planted them, I am at a loss to ascertain the proper period. Any information with regard to them will be thankfully received. I wish to plant a crop for winter use, as I am told they are excellent for milch cows.——I will, as I am writing, give you the result, or rather the product of one and a quarter acres of Cotton planted the past season. I procured one bushel of the seed from Alabama, for which I paid $10, called in Alabama the River Bunch Cotton, and here I call it Robert's Burr Cotton, from the fact of my being the first who planted it, and its striking resemblance to the common burr. The seed is a small white, and the texture of the Cotton much finer than the common Petit Gulf. Its leaves are a deeper green and shaped somewhat differently; the most casual observer will readily distinguish it from the other Cotton. It does not grow as high, and its limbs are much shorter; but it throws out a great many more of them, and I think not so liable to shed. I planted the Petit Gulf and Okra, sowing it in precisely the same quality of land, and the yield was from a third to a half more. I picked and ginned from the above one and a quarter acres six hundred and forty pounds of clean Cotton, or upwards of two hundred pounds of seed Cotton;† and on the acre of Petit Gulf, I obtained only about one hundred pounds. I have no hesitancy in believing it will yield extremely more than any

* In February sow Mangel Wortzel—Buckwheat is not grown among us. [Ed.

† There is certainly a mistake here which requires correction. The letter is printed as written, and we know nothing more than what is here given.—[Ed.

Cotton I am acqnainted with. I shall be able this year to give it a fair trial, and will report. I have planted seventy acres, and will be able to furnish seed the ensuing fall, at $3 per bushel, delivered in Charleston or Savannah. Yours, &c.

U. M. ROBERT.

P. S.—I would just here state that the land was only moderately rich, not having been manured in several years, and somewhat sandy. I planted in rows, four feet apart and two feet on the bed, leaving two stalks in each place. I would be glad to furnish a few hundred bushels of seed this fall to any person that might wish. U. M. R.

IRRIGATION.

BEFORE it can be understood how irrigation acts, let it be considered how pure water acts; it is not said rain water, for that acts in a double way, both by its purity and impurity. The more impure, the better manure is water. The purer water is the less is it fit for irrigation.

Pure warer acts only by its air. All water exposed to air, absorbs different proportions of its oxygen and nitrogen. This is a very slow process. It is found that most natural waters give out, by boiling, from every hundred cubic inches of water, 3 1-2 cubic inches of air. This air contais 8 or 9 per cent. more oxygen than an equal bulk of common air. Water is generally filled or saturated with air; it will take up no more by a month's exposure. If this water is boiled, and again exposed to air, it will absorb, in 24 hours, as follows: Let there be taken any number of measures of air, which are composed of 20 of oxygen and 80 of nitrogen. If 100 measures are absorbed by water, it is in this proportion—46.43 of nitrogen, 53.57 of oxygen: so that oxygen is three times more absorbable than nitrogen.

If, now, there is expelled by boiling, the air from pond or river water, it is found to contain 45.29 of nitrogen, 18.63 of oxygen; so that two-thirds of the oxygen have disappeared; this is the only fact which concerns the farmer. The oxygen has been absorbed by natural waters, and two thirds retained. What has become of it? It has gone—it is not said *all* of it, put in irrigation a large portion—to convert insoluble into soluble geine. Irrigation is chiefly employed on grass lands. The green sward here may not be broken up. What if it was? What if, by ploughing, it was exposed to the action of the air? Remember the properties of geine. Air converts the insoluble to souble, by forming carbonic acid—that is, the air combines with the carbon of the geine, and forms that gas. Give the geine this oxygen, condensed in water: wet it with this concentrated oxygen, crowd it into geine, as would be done by overflowing a meadow with water. It penetrates every crack and

cranny, and every mole's-eye hole; it expels the carbonic acid imprisoned under the sod. It is doing the same work upon the untouched green sward, which would be effected by ploughing and tillage. The long and the short of the whole action of irrigation with pure limpid water that, its absorbed oxygen, converts insoluble to soluble geine. Is this explanation which science offers, confirmed by practice? The appeal is made to all who have attended either to the theory or practice of irrigation, to bear witness to its truth. Is it not admitted that running waters are alone fit for this purpose? That after remaining a few days, they are abated and a new flood must cover the land? Is not this necessity of renewing at short periods, the covering of water, which shews no deposit, a proof that it has given up some invisible agent to fertilize the earth? This invisible agent is oxygen. Is it not evident from the extreme slowness with which air is absorbed by water, that, if it were not for the running water, which every few days replaces that which has acted, that the practice of irrigation with pure water could be never successful?

This is the principle, a principle which, having been wholly overlooked, has led to a waste of time and money, and has given to irrigation, in many minds, the odor, if not of a bad, at least, of a useless practice. Where, guided by this light of science, grass lands can be irrigated, let it be done. If the experience of the most enlightened agriculturist in Europe is not all deception, by simple irrigation with running water, the farmer may cut two tons of hay, where he toils and sweats to rake off one.

But by far the most fertile source of increasing crops by irrigation, is found in the impurity of water; the salts and suspended matter, the slime and genial mud of freshets. Perhaps the effects due to this cause, cannot be better illustrated, than by a statement of those substances and their amount, which fill the waters of the Merrimack—a flood of blessings! which rolls by those engaged in the din and hot haste of manufacture, as unheeded as was the earthquake, which thundered and trembled, and rolled away under the feet of the fierce soldiery, in an ancient battle. In the year 1838, during twenty-three days of freshets, ftom May till November, no less then 71,874,063 pounds of geine and salts rolled by the city of Lowell, borne seaward. During the five days of the great freshet, from January 28th to February 1st, 1839, no less than 35,970,807 pounds of the same matter rolled by, at from the rate of 112,128 pounds, to 20,405,397 pounds per day; each cubic foot of water bearing onward from 1½ to 30½ grains. This is only the suspended matter. That which is chemically dissolved by the waters, the fine filmy deposit, which occurs in a few days after the coarser and grosser matters subsibe, and the matter ordinarily suspended in the water of the river added to the above, for the year 1838, give a grand total of 839,181 tons of salt and geine, which were rolled down in the water of the Merrimack river.

What is this matter? Is it of any agricultural value? The answer to the first question will answer both. The dissolved salts are sulphate and geat of lime, and the fine deposit occuring after the water has settled, is composed of one half of geine, and the remainder of salts of lime and silicates. The great agricultural value is found in the clayey deposit which occurs in the first few days. The coarser part, that which collects about the foot of rocks, and falls, and eddies is composed as follows:

Geine,	3.92
Silex,	72.70
Oxide of iron,	9,15
Alumina,	8.30
Lime,	0.51
Magnesia,	0.10

But considering the elements as we have usually treated them, as silicates, salt and geine, the composition of the several deposits is shown in the following table:

	Geine.		*Sulph. of lime.*	*Phos. of lime.*	*Silicates.*
	Soluble.	*Insolu.*			
The coarse deposit above.	2.06	1.86	0.74	0.90	94.44
Freshet, 1839.	5.40	6.50	2.34	1.20	84.66
Freshet, July 7–18, '39.	8.80	6.30	3.20	0.60	81.20

If the doctrine of the action of silicates, salts and geine, upon each other when aided by growing plants, is considered, it cannot fail to be perceived that the fertility of soils, periodically overflowed by turbid waters, is owing to the elements, salts and geine which it contains, and to the exquisitely finely divided state of the silicates which from the bulk of the deposit. The carbonic acid of the air acts on each atom of silicates, while owing to the geine having been, as it were, irrigated, the oxygen of the air and water, must put that into a state to envolve carbonic acid. Hence, the silicates are at once decomposed, and their alkili liberated. How beautiful! It seems like a special interposition of that Beneficent Power, whose blessings, while they fill us with wondering admiration, at the infinite skill which directs every change in the material universe, should teach us also, that these changes are held up to us, not only to admire, but in some humble degree to imitate. Whenever man, "the faithful servant and interpreter of nature," has thus learned the lessons propounded by an infinite mind, he finds when he humbly imitates nature's laws, she is a kind and indulgent parent. She opens her hand liberally, and gives fertility by irrigation, and rivers and streams like holy water sprinkled by a reverend father, fructify all they bedew. With hearts thus attuned by the observation of the laws of nature, they respond to the gentle vibrations, caused by the decent of genial and fertilizing showers.

Rain is only natural irrigation: the water is found, like that of rivers, rich in oxygen and organic matter. The fertilizing power of rain, is referred to the same causes which lead to irrigation, to the salts and geine, which rain water contains. Several chemists have proved the existence of saline matters and organic substances in the air. The falling rain carries down with it salts of ammonia of lime, and a flocky organic matter. These all may be supposed floating in the air. The dry soils give to the winds an impalpable dust, its silicates and geine. When hailstones, which have been formed in the regions of perpetual frost, exhibit almost the same substances which are contained in rain water, the height at which these matters float, would almost compel the supposition that they exist in a gaseous state. From the examination of hailstones, by Girardin, a French chemist, it appears that no sensible trace of ammonia was detected during the evaporation of their water, but there was found a notable quantity of lime and sulphuric acid; and above all a large propotion of an organic substance containing nitrogen. Melted hailstones have the appearance of water, containing a drop or two of milk; by standing, the water grows clear, and the flocky matter which settles, burns with the smell of animal matter, and evolves ammonia.

It is a question whether even at the Giessen laboratory, this was not the source of the ammonia there discovered in rain water. It is taken for granted, that the ammonia in rain water existed as a volatile carbonate, because it was found to pass over in distillation. So did a volatile product, which always discoloured the crystals of sal ammoniac, procured by adding muriatic acid to the distilled water. This coloring matter, was noticed a century ago by Margraf. Later chemists have also detected ammoniacal salts in rain water, but no volatile carbonate of that base. It is well known that muriate of soda arises in evaporation, so does chromate of potash, and several other salts. If in distiling rain water, the ammonia did not pass over the volatile organic discoloring product, it may have gone over as muriate of ammonia. It is not questioned that ammoniacal salts exist in rain and snow water. The fact that it there exists as carbonate, seems to be assumed, and is incompatible with the salts which have been heretofore attained, from rain, snow and hail. This subject has of late excited much attention, and as the existence of salts in snow, is intimately connected with the old saying, that "the snow is the poor man's manure," it may be worth while to examine the foundation of this proverb. Like all others of this class, it will be found to rest on observation, and is supported by experiment.

For the Southern Agriculturist.

ON THE RIPENING AND FILLING OF CORN.

Mr. Editor,—Some years ago, I saw a field of rice which had been planted in June, overtaken by a sharp frost early in October. Consultation was had by those interested, with their neighbors (and among others, with myself, though then but a "looker on" the agricultural operations of my friends), as to the proper management of it under these circumstances. Planter and amateur proved alike ignorant of any facts bearing on the subject—and it was therefore cut down immediately, on the presumption that as the foliage of the plant had been very decidedly affected, it was useless to expect improvement in the grain from delay. Since that time, I have met with the following "Observations," which I submit to you for insertion in the Agriculturist, as not without value to rice planters, for like unfavorable seasons may bring the subject before some of them. These "Observations" were originally communicated to the Royal Society of Edinburg: but the summary below is copied from "Philosophical Transactions Abridged," vol. 1. p. 268. B.

Observations on the ripening and filling of Corn. By Dr. ROEBUCK.

SUMMER 1782, having been remarkably cold and unfavorable, the harvest was very late, and much of the grain, especially Oats, was green even in October. In the beginning of October, the cold was so great, that, in one night, there was produced on ponds near Kinneil, in the neighborhood of Borrowstownness, ice three quarters of an inch thick. It was apprehended by many farmers, that such a degree of cold would effectually prevent the further filling and ripening of their Corn. In order to ascertain this point, Dr. Roebuck selected several stalks of Oats, of nearly equal fulness, and immediately cut those which, on the most attentive comparison appeared the best, and marked the others, but allowed them to remain in the field fourteen days longer; at the end of which time, they too were cut, and kept in a dry room for ten days. The grains of each parcel were then weighed; when eleven of the grains which had been left standing in the field, were found to be equal in weight to thirty of the grains which had been cut a fortnight sooner, though even the best of the grains were far from being ripe.

During that fortnight, (viz. from October 7 to October 21), the average heat, according to Fahrenheit's thermometer, which was observed every day at eight o'clock in the morning, and six in the evening, was a little above 43°. Dr. Roebuck observes, that this ripening and filling of Corn in so low a temperature, should be the less surprising to us, when we reflect, that seed-corn will vegetate

in the same degree of heat; and he draws an important inference from his observations, viz: That farmers should be cautious of cutting down their unripe Corn, on the supposition, that, in a cold autumn, it could fill no more.

HARDY SORT OF RICE.

The Rev. M. Gabet, a French missionary at Jehat, in Mongolia, has lately forwarded to France a variety of Rice, which may turn out very useful to the Agriculturists of other countries. Whilst the rice hitherto cultivated requires a damp soil and irrigation, the present variety grows in dry localities, and is cultivated like wheat. A distribution of the seed amongst the Agriculturists of France, has been ordered by the Académie des Sciences, and as this variety is mentioned in Chinese works, M. Stanislaus Julien has printed from the Chinese "Cyclopædia" some notices relating to its mode of culture; amongst which the following possess the greatest interest.—This species of Rice, at the present time is cultivated in the province of Fokiem. It requires to be sown on an elevated situation, being equally productive in the more arid region of China, and in those parts where the supply of water is most plentiful. In general it is sown and cultivated exactly in the same manner as wheat. When the ground is prepared, the seed is steeped in water for one night; after sowing it, the land is well soaked with water in which the *ashes of Rice-straw* have been previously mixed. It is then hoed at three different times, and is each time watered with liquid manure. [*The London Gardener's Chronicle.*

For the Southern Agriculturist.

MOVEABLE COW-PEN.

Cut scantling or chinquapin posts into lengths of about 5 feet, slit boards into laths 3 or 4 inches wide, and nail three or four of them on to three posts to form a pannel; into the opposite side of the posts make oblique mortices for braces to support the pannel. The braces may be pine saplings or laths and either morticed into the back of the posts as above, or fastened on to the side of the posts by a pin. The pen may be made of as many such pannels, each of which separate, as may be desired. Twenty being the number necessary to inclose a quarter acre. The advantages of this pen are, that it does not cost more than the common rail-pen, and frequently not near so much, is easily moved from spot to spot by the cattle-minder and a boy, easily transported from field to field, and lasts much longer than rails would. It is intended principally for a moveable pen, but would answer equally well for a stationary one, by having the pannels about 2 feet higher. While upon the

subject of cow-pens, I would certainly advise that the spot where a cow pen has been, should be listed the day that the pen has been removed or soon after; as I cannot understand, how manure can be exposed to the heats of summer, or washing rains of winter, without losing much of strength. I do not think that under the list, is, under any circumstances, the place for manure, as all the lateral or feeding roots in our ridging system of cultivation, run a little below, and parallel with the surface of the bed; and consequently seldom derive much good from, or reach down to, any manure placed below the list. But in the case of slipping the cow-pen, I do not see how it can be placed any higher. Another objection to manuring under the list, is, that which is under the list one year, is, the next, on the surface of the bed, where it is exposed too much to the sun and rains, and is of more benefit to the grasses that annoy us, than to our crops; while manure placed upon the list is not only in the best situation to benefit our crops, but always remains in the same position, while the bottom and tops of the beds only change places, the middle always remaining in the middle.

INTERESTING TO COTTON GROWERS.

THE subjoined communication from an esteemed friend and occasional correspondent, will commend itself to our agricultural readers. They are, of course, better judges than we are, of the value of the suggestions made by "D." To us they appear plausible.—*Memphis Enquirer.*

Panola Cy. (Miss.), Jan. 26, 1842.

Mr. Editor,—It is usual for Cotton growers to sun their Cotton as they gather it, and then gin it as early as possible. This, according to my judgment and experience, is clearly wrong. Cotton should never be sunned, unless it be such as has been gathered quite wet with rain; nor should it be ginned until it has been heated.

Heat diffuses oil, and we know there is a large quantity in Cotton-seed. Now, sir, put it together as you gather it, both morning and evening, and there is sufficient moisture to make it heat. This being the case, the oil in the seed is diffused throughout the lint—for it cannot evaporate. When it remains in this situation a sufficient length of time to spoil the seed, the Cotton should then be thrown up and cooled. Care should be taken not to let it turn blue:—this however, is not so easily done as you might suppose.

The process of turning over and throwing up will likely have to be repeated two or three times before the seed are entirely spoiled. The trouble of overturning and tossing it up in the cotton or gin house, is not greater than sunning it on a scaffold. By this process

you gain the weight of the oil which is diffused throughout the lint, and which gives the Cotton the oily gold color which is desirable, and also that elasticity and adhesive quality, like wool, which never fails to enhance its value.

But, sir, there are other advantages growing out of this operation: the gin will pick at least one-sixth faster, and clean the seed much cleaner when the Cotton has thus been compressed together; and instead of cutting off short particles, as is always the case when the Cotton is open and fresh, the saws take it off in large flakes, thereby making the staple longer and stronger.

Every farmer knows that his early Cotton outweighs, and has better staple than his late Cotton; and he also knows that the earlier it is gathered after it opens the better. Now, sir, these facts show the correctness of my theory; for exposure to the sun and rains evaporates the oil from the seed and makes the lint short and light.

Farmers should secure in dry weather and from evening pickings, in a house to itself, or a portion of the gin, sufficient of dry good Cotton, to make seed, but the balance of their crop they should be sure to subject to the process of heating and cooling in the shade. It is said that the British East India Cotton is vastly inferior to ours at present. If we can make our Cotton still better, the danger from that quarter will be lessened.

LIME.

Much as we have seen and heard about this substance, we were not aware that the properties claimed in the following article had been assigned to it. The communication is taken from the Farmers' Cabinet, and appears over a signature that we have often remarked accompanied some of the ablest productions in that excellent work. The author first alludes to the fatal disease that is now destroying so many of the cattle in England, which he thinks may be cured by the use of Lime. He quotes the first paragraph from an old No. of the American Farmer.

"Some years since I purchased a horse, but he had the appearance of laboring under disease; I commenced a course of treatment which I had before persued in cases similar to appearance, but without effect; I was therefore induced to try the use of *lime*, as I was confident he was filled with botts, for he had discharged several; I therefore commenced by giving him a table spoonful of slaked lime three times a week in brand mashes. After pursuing this course near two weeks, the botts began to pass away in quantities, varying from ten to twenty, which he would expel from his intestines during the night; in the meantime his appetite began to improve and in six weeks he was one of the finest geldings I ever saw; from that day to this I have kept up the use of lime amongst

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my horses with decided benefit; and as an evidence of its good effects, I have not lost a horse since I began to use it. And lime is a certain preventive in keeping cattle from taking the murrain. As an evidence of this fact, I have used it among my cattle three times a week, mixed with salt, for three or four years, and in that time I have not lost a single animal by this disease; but in the mean time some of my neighbors have lost nearly all the cattle they owned. But I will give a stronger case than even the one above mentioned. One of my neighbors who lost all his cattle, had a friend living within two hundred yards of him, who had several cattle which ran daily with those that died, and his cattle all escaped—he informed me that he made it an invariable rule to give his cattle salt and lime *every morning*. I have, therefore, no doubt but salt and lime are a sure and infallible remedy for botts in horses and murrain in cattle."

And I am reminded of a circumstance by a friend, who has often before mentioned it; he had two fields of pasture near his house—on one of these he spread lime upon the turf to the amount of more than 200 bushels per acre, but as the other fields lay immediately below his cattle-yard, from whence he had formed drains to carry the water over its surface in the most complete manner, he determined to let that suffice for a dressing; and the effects of the highly impregnated water from the yard was a growth of grass truly astonishing. Both fields were kept in pasture, and when the stock had eaten one of them down, they were removed to the other, and so changed regularly about; but the effect of the different crops on the appearance of the stock, horses and cattle, is not to be expressed, for while feeding on the limed land their coats were close, shining and healthy, and their spirits light and cheerful, even when they were compelled to labour hard to obtain a belly full; but when turned into the watered grass, six inches or more in height, a difference for the worse could be perceived in 24 hours, and every day after they lost condition amidst the greatest abundance, with coats rough and staring, lax in the bowels and flaccid, with distended paunches, dejected countenances, and sluggish in their movements: they soon exhibited a depreciation in value to the amount of about half their former worth. But the transition to health and vigor and good looks was quite as sudden and apparent on a return to the limed land, for again in 24 hours, or by the time the food had passed through the system, a change, particularly in their air and carriage, was very perceptible.—My friend adds, he never had an instance of the murrain or botts while his stock fed on these pastures, but is satisfied he should have had both, but for the change to the limed land; for while feeding on the watered pasture, the stock had always the appearance of a predisposition to that state of the derangement of the digestive system, by which he has no doubt these diseases are engendered.

In conclusion, I would ask, is it not quite fair to draw the following deduction from what has been said, namely, that all dairy

pastures ought to be heavily limed, it being the most natural thing in the world to suppose that a proper secretion of milk, the best and most wholesome, depends very much on the nature of the food with which the animals are fed? and must not the butter from a cow that is in health and spirits, be of better flavor, color, and consistence, than that from one that is lax, washy and weak, from feeding on watery, acid, and soft herbage? and will not this account for much of the disgustingly rancid, ill-flavored and ill-looking butter which we so often find in the market? My friend above quoted, and who is now at my elbow, answers, "Yes; for while my cows fed on the watered meadow, the butter was scarcely eatable—white, soft, and ill-flavored, but it was sweet, firm, and fine flavored, when they were confined to the limed land." Ergo, lime your pastures, and allow your stock as much salt as they will consume daily, for I am convinced that lime and salt are a remedy for "botts in horses," as well as the "murrain in cattle." VIR.

[*Southern Planter.*

INDIAN CORN FOR FODDER.

Mr. Editor,—I wish to sow two or three acres of corn for the fodder, and not being acquainted with the crop, I should like to be informed as to the quantity of seed to be sown per acre, the time of sowing, the manner of tilling or putting in the crop, at what time the crop should be cut up, and all other little particulars concerning it, that I may be successful in the experiment.

If you will give the necessary information through your paper, you will afford many subscribers valuable information. If such a crop will produce from five to seven tons per acre—after being cured—as some persons pretend that it will, it would be well for farmers to understand it. LEDYARD.

Cayuga, Co., New York.

Remarks on the above.—The cultivation of Indian Corn for fodder may be well recommended to the farmers, especially where pasturage is deficient, or in a season where the crop of hay is likely to be small. Among the farmers who supply the cities with milk, it is a favorite crop, and is given to their cows at night and morning to assist a short pasture. In such cases it is sowed at successive seasons, every week or fortnight, so that the crop may be coming on as needed. It is sometimes cut when it is knee-high, and then in general it will start a second time, so that another cutting may be obtained. This should not, however, be confidently relied upon. Where it is wanted for green feed, it is of course advisable not to cut it until the plant is in perfection; we do not mean until the seed is ripened, but until the leaves and stems are as abundant and large as they are likely to be; that is when the flower is protruing,

and the ear formed, and yet no part of the plant has become too hard to be completely eaten up by the cattle. Every farmer, therefore, may make his calculation as to the time of planting. The earlier he plants, the sooner he will have the fodder and the more of it to give to his stock; and by planting at successive times at his convenience, he may keep a supply of succulent food to the very end of the season. None need to be lost; and every leaf and stem of it should be saved, even after the frost has killed it.

We have seen the plant cultivated to great advantage for soiling cows, in many instances; in one where twenty cows were kept; in another where one hundred cows were soiled. In the latter case several acres were sown with corn for this purpose; and it was cut and brought into the barn as wanted. There was no feed of which the stock were more fond; none which produced more milk; and none obtained at a less expense. It was all cut short by a machine, and while gathered green every particle of it was consumed. When in the autumn it became dry, it was steamed for the stock. Among the milk farmers, near the cities, its cultivation is constantly increasing.

We have known it likewise used for store hogs. Where pasturage is deficient, or where they are kept in styes, no green food is more relished by them or more conducive to their thrift. In this case, however, it is of course given to them in a green and succulent state.

We have not known it cultivated extensively for winter fodder, but there is no reason why it should not be. In this case it would be desirable to sow it early, if we would have the largest crop, and let it come to what maturity it will. The value of will cured corn fodder for stock is settled. The cattle have determined the question long ago by the relish with which they eat it; and the good condition in which it keeps them. The amount of well dried corn fodder including butts as well as tops, where the crop is fifty bushels, is generally estimated at two tons; this is of the small yellow flint variety of corn; the southern gourd seed variety and the western corn, produce a much larger amount. Farmers in general are disposed to estimate the fodder upon such an acre of corn well saved, as equal for any neat stock, to one ton of English hay. Some place it at one and a half ton; none lower then three fourths of a ton.

The only instance, which has come within our knowledge, of ascertaining with any exactness the actual amount of fodder or stover upon an acre, was in Pennsylvania, where we infer the gourd seed variety was cultivated, and where the crop amounted to 66 bushels. In this case,

	Tons.	cwt.	lbs.
The blades, husks and tops, amounted to	1	6	13
Stalks and butts, - - - - - -	1	7	00
	2	13	13

How much could be obtained by sowing it exclusively for fodder, we have no means of determining with any accuracy.

Nor have we any certain prescription to give as to the amount of seed to be used for any acre; certainly not less than half of a bushel, nor more than two bushels. Corn is a plant which, in rich soil, tillers abundantly or throws out many suckers, unless where it is very thickly sown, in which case it comforms to every other plant in its habits of growth, and runs up in a slender form like bushes in a thick swamp. Many persons advise to sow it broad cast, in which case it admits of no after cultivation, and the weeds, if the land is rich, will check its growth and fill the ground with their seeds. It is best to sow it in drills two feet apart, and quite thickly in the drills, scattering the seed over a space in the row, six inches or a foot in width. It may then be ploughed or passed through with a cultivator once at least; and in a measure kept clean from weeds. It is believed that as much fodder may in this way be obtained from an acre, as if sown broad cast.

The land cannot be made too rich for it; and it need not be gathered until it is ripe. There may be a good many imperfect and some ripened ears among it; but the cattle will not like it the less on that account. The Irishman was asked how he kept this horse so sleek and fat; and "faith!" says honest pat, "he has nothing but whate straw, your honor, and that is not *half threshed*." It is a prevalent opinion that the two top stalks of Indian corn when cut in a succulent state, and cured quite green, are better than when left to ripen. It is believed that this is an error; as the experience of observing farmers, we think, will show that their cattle do better, prefer them, give more milk and show better thrift, when fed upon the butt stalks, that is the leaves and husks upon the butts after the corn had been gathered, than upon the top stalks gathered and cured in a green state, as above described. The fodder need not then be harvested until it is, as it is termed, nearly dead ripe. Corn fodder when cut green, especially late in the season is cured with great difficulty; but if left to stand until it is as either killed by the frost or reaches to maturity, it is easily saved as hay. In putting away corn fodder, we have found it advantageous to insert occasionally, layers of wheat straw. The sweet flavor of the corn fodder is communicated in some measure to the straw; and the straw serves to keep the corn fodder from being injured by heating. No fodder suffers more or sooner from wet or rain than corn fodder.—Every possible pains should, therefore, be taken to avoid this; and it is a good way to hang as much of our corn fodder, as we have room for, on the beams and on poles extended over the barns floors, and in sheds where it will be out of the reach of the cattle.

As to the kind of corn to be sown, the Southern gourd seed or the Western corn, will undoubtedly give the largest weight; but

much of it will be in the butt, no part of which will the cattle eat.

Our common Northern small flint corn yields a large amount to the acre, as it will bear thick sowing; and the main stalk is not so large but that a good deal of it will be eaten, especially if cut up.

[*Conn. Farmer's Gazette.*

SALTPETRE FOR CORN.

A friend has placed in our hands a newspaper, from which we have copied the following article from the *Watertown Standard.* As a coroboration of the statement there made, we were lately informed by Dea. Samuel Raynolds, for many years an intelligent and careful farmer of Long Meadow, Mass., now of West Haven, that he has long been accustomed to soak his seed Corn in a solution of saltpetre, and that its effects, as a protection from insects, and in giving a rapid and healthy growth to the plants, were such as to astonish all who were not accustomed to use it. Mr. Claudius Allen, one of the best farmers in New-Haven county, also stated to us a few days since, that he had occasionally, for several years past, applied to his Corn in the hill a small quantity of earth taken from under his barns and other buildings; that the application was always followed with gratifying results—sometimes with as marked effects as those stated in the *Standard.* On one occasion, several years since. Mr. Allen took a quantity of earth from the bottom of his cellar, and placed it around the apple trees in his orchard; the consequence of which was, a luxuriant growth of grass, which has continued annually up to the last season. It is well known that the earth taken from beneath old buildings is strongly impregnated with nitre; and this satisfactorily accounts for its fertilizing effects. So fully is Mr. Allen convinced of the value of saltpetre, that he and one of his neighbors have together ordered from Boston *half a ton* of the article in its crude state, which they propose to apply to different crops during the coming season, in various ways. The result of their experiments we hope to publish in the fall.—*Conn. Farmer's Gazette.*

The following is the article from the Watertown Standard, alluded to above:

IMPORTANT TO FARMERS.

Hart Mussey, Esq., of this village, took a small portion of the seed Corn with which he planted a field, and soaked it in a solution of salt nitre, commonly called saltpetre, and planted five rows with the seed thus prepared. Now for the result. The five rows planted with Corn prepared with saltpetre, yielded more than 25 rows planted without any preparation. The five rows were un-

touched by the worms, while the remainder of the field suffered severely by their depredations. We should judge that not one kernel saturated with saltpetre was touched, while almost every hill in the adjoining row suffered severely. No one who will examine the field, can doubt the efficacy of the preparation. He will be astonished at the striking difference between the five rows and the remainder of the field.

Here is a simple fact, which if seasonably known would have saved many thousands of dollars to the farmers of this county alone, in the article of Corn. It is a fact which should be universally known, and in all probability, one of the greatest discoveries of modern times in the much neglected science of Agriculture. At all events, the experiment should be extensively tested, as the results are deemed certain, while the expense is comparatively nothing.

Mr. M. also stated as to the result of another experiment tried upon one of his apple trees last spring. It is a fine, thrifty, healthy tree, about twenty-five or thirty years old, but has never in any one year produced over about two bushels of apples. While in blossom last spring, he ascended the tree, and sprinkled plaster freely on the blossoms, and the result is, that it will this year yield twenty bushels of apples. Now if the plaster will prevent the blast, it is a discovery of great importance. Mr. M. was led to make the experiment by reading an account of the production of trees adjoining a meadow where plaster had been sown at a time when there was a light breeze in the direction of the orchard, the trees contiguous to the meadow bearing well while the others produced no fruit.

NEW SPECIES OF CLOVER.

A friend in France recently gave me the following information: —"In a late excursion, I found a grass lately introduced into the country, of a new description. It is here denominated the Scarlet Clover, and is thought far superior to any thing of the kind which has been cultivated. It is highly valued for green feed, and may be introduced at different periods of the season. Its growth is very rapid, the stock large, tender, succulent and nourishing. The Ipswich Gazette, (Eng.) thus describes it:

'*New species of Clover.*—As an addition to our spring food, a new species of Clover has lately been introduced from Italy into the agriculture of this country. It is called *Trifolium incarnatum*, and bears a beautiful head of bright and red flowers, resembling sainfoin in color. It requires a good soil, and the mode of cultivating it hitherto pursued has been, to plough up a wheat stubble, immediately after harvest, and sow the seed at the rate of eight pounds an acre. It produces a large burden, which comes to use

at the commencement of the following May—a period when such a supply of green food must be of incalculable value, and which will admit of turnips following in succession.'"

With this communication, I received a small quantity of the seed. I sowed the last of August, and the vegetation was surprisingly quick. My cattle fed incessantly on it through the season, starting favorably in the spring. But its thrift was not of long continuance. I sowed the greater part of the seed late in the fall, and it wholly failed. I expect more of the seed, and think I can correct my manner, and that it may prove beneficial.

I am yours, J. W.

Dorchester, Feb. 22. [*New England Farmer.*

BIRDS.

Mr. Editor,—As the season has again arrived when the feathered tribes begin to make their appearance amongst us, I wish to say a few words on a subject that has received the attention of far abler pens then mine; but a wish to cast my mite into the common treasury on the score of humanity, has induced me also to put pen to paper. We all know that from the time when these little harmless friends of the farmer first arrive in the spring, until the day of their departure in the autumn, they are made the subjects of an unceasing, bitter persecution, merely for the sport and fun of the most worthless part of society. These valuable servants of the farmer, who work for him day after day, and receive nothing for their labor, securing his fruit and crops from destruction, are killed off just for sport; and a reckless spirit of destruction is engendered, which, in the young, is ofter the fruitful source of crime and punishment in after life. Now, I hold it wrong to take away the life of any of God's creatures for fun or pastime—much more, those that are of such service to man. Nothing was made in vain; every living thing, from the ephemeral insect up to man, was made for some use. True there are some of our birds—the crow, the hawk and the black-bird—that are supposed to do considerable injury at certain season of the year, yet it may be fairly presumed that the good they do far overbalances the injury; for observe the immense number of worms and bugs of every description that are destroyed by the black-birds through the summer. It is also true that they will help themselves to a little corn at harvest, but how infinitely small is the quantity they destroy, when compared with that which is destroyed by the cut-worm! But those birds which are of the greatest *use* to the farmer, are they which suffers the most—namely, the robin, the blue-bird, and the tom-tit; and so fast as their numbers decrease, in the same proportion do the tribes of hurtful insects increase; and should this destructive spirit continue for a few years longer, it will be difficult for the farmer to raise any

crops at all. Let therefore the farmers raise up as one man, and stop the wanton destruction of the inoffensive creatures: let them teach their children the insanity and cruelty of the practice, and let the public teachers of schools inculcate the blessed doctrines of humanity to brutes and kindness to every thing that has life; especially to abstain from destroying birds and robbing their nests. But more particularly, let every farmer do his utmost to keep from off his property those miscreants whose sole business seems to be to prowl about the country with the gun, and waste their time in the unprofitable employment of destroying the lives of animals that, after all the labor, are not worth a tenth part of the cost of powder and shot; and this they will do in their own defence, when they see the importance of the subject, and experience the loss which is yearly accruing from the destruction of these their most valued friends, and witness the injury done to their fences, fruit trees, and crops in general, by the trespass of a company of freebooters, who are generally the off-scouring of society. Let then our farmers look to it, before it be too late.

E. BIERER, Jr.

Union Town, Fayette Co., Pa. [*Farmer's Cabinet.*

THE WHITE ASH.

It has frequently been said, and sometimes written, that the leaves, bark, and wood of the white ash have power over serpents, so that they cannot bite where this opponent is near them; and some say that the leaves, bark or word of the white ash is a complete antidote to the poison of serpents. We are told many things about this, which seem marvellous; but I am inclined to believe that there is much truth in what is related concerning the virtues of this tree.

I have had no means of making experiments with the ash upon serpents, or wounds made by them; but I have often applied an ash leaf, rubbed between the fingers, to the pimples caused by mosquitoes. The itching and soreness were instantly removed. In one case, when I had been stung by a bee, I applied the same; when I applied the leaf, the pain was severe; as soon as the leaf was applied, the pain ceased.

Within a year or two I saw an account, which seemed to be well authenticated, showing that sheep had been cured by a decoction of white ash bark, when poisoned by the small *laurel* or *calpia*.

The few facts which I have witnessed, and the many that have been related, induce me to request the Editor of the New-England Farmer to afford his aid in obtaining information on this subject. Those who reside where venomous serpents are common, may be able to give us well authenticated facts, which will show conclu-

sively whether this tree has such powers as are ascribed to it. Every person must be regarded as interested in such information.

The white ash is one of our most beautiful trees, and the strength and elasticity of its timber, render it very valuable. If the obliging Editor will afford his aid, we may now learn from every part of the country what is known concerning its virtues in preventing and in curing poison. S. W.

☞ We remember it used to be said in our boyhood, that if we had a mixture of white ash in the wood-pile, no snakes would come near the house. We had classed this among "idle tales" not worth regarding. But as our correspondent has experienced the efficacy of the ash for other good purposes, we may have "idly" discarded the old saying. Any facts upon the subject we shall be happy to publish.—[ED. N. E. FARMER.

AGRICULTURE OF EUROPE, COMPARED WITH THAT OF THE UNITED STATES.

WE have before us "McGregor's Statistics," which contains a curious table, compiled from one prepared by Baron Von Malchus, Minister of Finance in Wurtemburg, in 1828. It exhibits the Agriculture and Live Stock of all the nations of Europe, in a manner similar to the statistics recently obtained by the United States.

The total amount of *grain* then raised in some of the most important nations were as follows. Grain here includes wheat, barley, oats, and rye:

Great Britain,	262,500,000	bushels.
Prussia,	145,000,000	"
Denmark,	40,133,000	"
Austria,	366,000,000	"
France,	233,847,300	"
Spain,	68,000,000	"

If we divide the results by the number of inhabitants in each country, we get the number of bushels raised to each soul:

Great Britain, to each soul,	12	bushels.
Denmark, "	20	"
Prussia, "	12	"
Austria, "	14	"
France, "	7	"
Spain, "	5	"

It appears, then, that the northern part of Germany raises a much larger portion of grain than either England, France or Spain.

In the United States, the amount of the same grain (wheat, barley, oats, and rye,) raised, is in the aggregate about 317,000,000 bushels—to each soul about 18½ bushels. The United States, then,

raise *more grain* than any country of Europe, in except Denmark, and much more than the average produced in Europe.

Let us now compare the *Live Stock*.

Of CATTLE the following are raised in the above named countries:

Great Britain,	10,500,000
Prussia,	4,500,000
Denmark,	1,607,000
Austria,	9,912,900
France,	6,681,000
Spain,	2,500,000

These again divided by the population, give the following results:

England, to each soul,	1-2 of one.
Prussia, "	1-3d "
Denmark, "	4-5ths "
Austria, "	3-11ths "
France, "	1-5th "
Spain, "	1-5th "

Denmark and England have much the largest portion of cattle, though Russia, not included in the above, has nearly as large a portion of cattle as England. In the United States, the number of *Cattle* is about 13,500,000—to each soul, 4-5ths. The proportions, again, is nearly or quite as high as Denmark, and higher than the average of Europe. But if we examine particular States, we find some that have a larger number of cattle in proportion than any part of Europe—Thus in Vermont and New York, there are more cattle than there are living souls.

Of HORSES, the European proportion is thus:

Great Britain, to each soul,	1-11th
Prussia, "	1-10th
Denmark, "	1-4th
Austria, "	1-16th
France, "	1-12th
Spain, "	1-8th

In the United States, of Horses there are about 3,000,000—which is to each soul, 1 5th. This also is a larger proportion than that of Europe. The comparison in SWINE is interesting.

The proportion of Hogs to each soul is:

England,	1-4th
Prussia,	1-8th
Denmark,	1-6th
Austria,	1-6th
France,	1-7th
Spain,	1-13th

In the United States, the total number of Swine, is about 21,000,000—which is to each soul, 1¼; or very far greater than any country of Europe.

Thus the number of Hogs in the United States is greater than all of England, France, Prussia, Austria, Spain, Denmark, Bavaria, and the Netherlands, making a population exceeding one hundred and twenty millions.

Of SHEEP, the proportion in Europe, to each soul, is thus:

Great Britain,	2
Prussia,	3 4ths
Denmark,	2-3ds
Austria,	2-5ths
France,	1 1-10th
Spain,	1

In the United States, the number is 19,000,000—the proportion is 1 1-8th. In this article, England is in advance of the United States. In the State of New York however, the proportion of Sheep is as high as in England.

There is however, another aspect to this comparison. What is the relative product per acre? We have not the means of knowing the number of acres of *arable* land in the United States; but there are some local statistics from which we can gather something.

The number of acres of *improved land* in the State of New York, is about - - - - - - - - - 10,000,000
In Great Britain, - - - - - - - - 97,000,000
The proportion is nearly ten to one.

The grains raised of the kinds mentioned, is in New York, - - - - - - - - - - 38,000,000
In Great Britain, - - - - - - 262,000,000
The proportion in New York is the greatest.

Cattle in New York,	2,645,000
" Great Britain,	10,500,000
Sheep in New York,	5,381,000
" Great Britain,	44,090,000

In Grain, Cattle, and Sheep, then, the State of New York raises more per acre than Great Britain.

If the comparison were made only of the agricultural districts of England, the result would not be the same; for England does raise more wheat per acre, under *good cultivation* than the United States. But when the hills of Scotland, the bogs of Ireland, and the fens and moors are taken into consideration, the United States is the most productive country by far.

In this comparative view of Europe and the United States, we may see the true ground of that physical growth, which characterises the United States, and which undoubtedly must characterise it for many centuries to come. [*Cincinnati Chronicle.*

HORTICULTURE.

THE KITCHEN GARDEN.

[As mentioned in our first note, we re-publish this small work entire, and without alterations of any kind, but it will be borne in mind by our readers, that these directions are intended for the climate of England, which is cooler and moister than ours in summer and colder in winter, which necessarily occasions a change in the times of sowing and cultivating certain vegetables, such as turnips cabbages, &c. The season for performing these operations also vary; and we refer our readers to the calendar published in th last volume of the Agriculturist for particular directions as to time, and we will only observe, that as a general rule, the spring operations should be performed in a month earlier, and the fall, a month later, than indicated in this work, that being about the difference in our climate.—Ed. So. Ag.]

THE KITCHEN GARDEN:

A hand-book for Cultivators, containing full directions for the profitable culture of all kinds of culinary Vegetables. By James Main, A. L. S., author of "Flowers;" and "Fruit Trees."

(Continued from page 209.)

CULTIVATION OF STEMS.

The stem of plants used in the kitchen are the folowing viz. Asparagus, Leek, Onion, Shallot, Garlic, and Sea-kale.

Of Asparagus, *(Asparagus officinalis).*—This vegetable delicacy is a perennial, having a system of many thick fleshy roots united in a crown, whence spring up a succession of shoots, which, when six or eight inches long are fit for use. For the free extension of the roots, and easy perforation of the rising shoots, the plant delights in an open porus soil; and in order to its luxuriant growth it can hardly be too rich. Low lying alluvial soil which has a large share of decayed vegetable matter in its composition, seems peculiarly suitable. Where this discription of soil does not naturally exist, one entirely artificial must be prepared for it. The piece of quarter ground intended for asparagus must receive an extraordinary coat of rich dung, which is trenched in eighteen inches deep; when the surface is levelled, another coat of well rotten dung, leaf-mould, and sand if thought necessary, is digged in. This last dressing is to encourage the young plants; the first is intended for the range of the full grown plants in future years.

The ground thus prepared is divided into two feet beds for single rows of roots, with eighteen-inch alleys between; or into four-feet beds, for three rows of roots, with two-feet allys between: or into five-feet beds for four rows of plants, with two-and-a-half-feet alleys between.

The beds are either stocked by seed, sown thinly in drill, or, what is most usual and a better plan, with two years old plants from a seed bed; and, for two reasons the new beds are sooner productive,

and the plants can be more regularly disposed in the rows. Whether sown or transplanted, drills are made on the beds by line at the due distances. If plants are chosen, they are forked out of the seed bed, the largest selected, placed in a mat, that they may not get dry or withered before they are planted. The plants are placed in the open drills, nine inches apart and about three inches deep, the crowns leaning against the upright side of the opening, with the roots spread right and left in the bottom. When one row is planted the roots are immediately covered with the earth raised out of the drills: another is opened and planted in the same way, till the whole is finished. Stout sticks are driven, to mark the corners of the beds, to direct subsequent operations.

The month of March, if the weather be mild, is the best season for planting; though any time in April will do rather then lose a season. The summer management is to see that there are no blanks; but, if any, that they be marked with sticks, to shew where new plants may be put in during the following spring. The beds must be kept perfectly free from weeds; and it is usual to plant the alleys with caulitlowers, lettuce, or dwarf kidney beans; in short, with any other plants that will not shade the beds.

When the stems die in the autumn, they should be cleared off; the surface of the beds should be forked over, taking care not to disturb the roots; and covered with a coat of old hot-bed or other rotten dung about two inches thick, and this overspread by about an inch or two of earth taken from the alleys. This is called the winter dressing, and is not done so much for defending the roots against frost, (for, in fact, asparagus is a very hardy plant), but that the virtues of the dung may be washed down to the roots by the winter rains, and because the decomposition of the dung forms that kind of light spongy soil in which the plant delights.

In the following March, the beds are again loosened up with the fork, but not so deep as to injure the roots. About this time the new buds are beginning to rise, and therefore care must be taken that they are not damaged. The earth and part of the dung laid on in the autumn is then raked off into the alleys, reducing the height of the beds as near again as possible to their old level; for, if this be not attended to, the beds, in a few years, become unsightly and inconveniently high, the crowns continuing to rise from their first place to their natural distance from the surface, which is not more than three inches, though, when grown for sale, the crowns are kept covered much more deeply, in order to obtain the marketable length of the shoots.

In the third year the plants begin to be productive, but it is better to forbear cutting for use till the fourth year; and even then one shoot only from each stool should be cut. Taking the crop before the roots are fully established, weakens and prevents them arriving at that strength and amplitude which can only enable them to produce strong handsome shoots, and therefore refraining from

cutting till the fourth or fifth year ensures an ample supply for many future years.

If a plantation of asparagus be laid down in the manner above described, and if it be properly managed afterward, and no injury done to the roots by careless forking, or by severe and indiscriminate cutting, such a plantation may continue productive for ten or twelve years, more especially if any blanks which may accidently occur be immediately filled up. But in large family establishments it is good practice to lay down at least one bed every year, for one of the oldest to be taken up for forcing; for forced asparagus is as necessary in such families as is that from the natural ground.

As the excellence of this vegetable depends chiefly on its size, the plant, like all others comes to the greatest perfection when allowed the richest soil, the fullest air and light, and the widest spaces to grow in. On this account, planting it in single rows—that is, one row on a two feet wide bed, is recommended as the best method to have very fine asparagus. This plan, however, is not the most economical, because so much space is required; but where this is not an opposing object, and when the alleys are also cropped, it cannot be said to be an extravagant waste of ground.

There are two varieties of asparagus in cultivation—namely, the Reading and the Battersea. The only difference is that the one has purplish coloured shoots, while the other is greenish; both having the same flavour and equally tender. The finest asparagus seen in the London markets is produced on the alluvial lands on the banks of the Thames, as at Deptford, Battersea, and other places higher up the river; single shoots from some of these places often weighing nearly one ounce each.

But, although what is stated above is the ordinary plan of cultivation, it is quite certain that this vegetable may be grown with much less preparation and subsequent care Any piece of ground which is naturally rich and some what moist, if moderately dunged and only digged, the surface levelled, and laid out into four-feet beds to hold four rows of plants at nine inches distance every way,—the plants, two years old seedlings, put in any time about the beginning of April, and when covered up receiving a surface coat of very rotten dung as a mulching against drought—such a plantation will succeed admirably, and in due time will be as productive of middle-sized shoots, as if it had been laid down ever so expensively.

To force asparagus, so to have supplies for table in February and March, a dung hot-bed must be made about Christmas, or if required at that festival, the bed or beds must be made in October. The bed should be substantial—formed of hot, well-prepared stable dung three feet high and one foot wider then the frame intended to be set upon it. Soon as the bed is finished, cover it immediarely with six or seven inches of good mould to receive the plants. Mark the width and length of the frame upon the surface;

and within this mark the roots are to be placed, beginning at one end; first raise a little ridge of the earth, against which lay the first course, as closely together as possible, drawing a little of the earth to the bottom of the roots, to keep them in order. Against, the first course lay another in the same way and a third against the second, and so on, course against course, all the way to the end; the crowns being kept as nearly level as possible. When the whole is planted, let some moist earth be banked up against the outside, roots all round, an inch or two higher than the crowns; which done cover the roots with light earth about two inches thick, which finishes the work for the present.

In a week or ten days after the bed is planted, if the heat be moderate, or if very bad weather, great snow or excess of rain, put on the frame and lights.

When the buds begin to appear, add another layer of mould about three inches thick; but just previous to this, a thick wreath of straw bands should be fixed round the upper edge of the bed, to set the frame on, and kept in place by wooden pegs stuck through the bands into the dung. Next, a final covering of light earth is laid over the rising buds, so as to increase the thickness above the crowns to at least six inches. Thus, all arranged, the frame and lights are put on, and if the heat be still lively, air must be admitted by rising the lights a little behind. But if the heat has declined, the bed should be surrounded with trusses of straw to keep in and increase the heat, and when this fails, recourse must be had to linings of hot dung all round. Air must be given daily; for light gives colour and flavour, and fresh air prevents the shoots being too much drawn.

The bed begins to yield its crop in four or five weeks, and continues to produce above three hundred shoots per week for a fortnight or three weeks longer. When asparagus is required throughout the winter, and until it comes in from the natural ground, a bed should be made every month from October to February.

The best plants for forcing are those of three years' growth—that is, one year in the seed-bed, whence they are transplanted into nursery beds to grow for two years previous to forcing them. In private gardens, provision is annually made for obtaining such supplies; but in most cases, they are or may be purchased of nurserymen or market gardeners, who raised them for sale. A full-size melon frame of three lights requires about six hundred plants to fill it properly.

But when it happens that an old bed or two in the open ground is to be destroyed, the best of these old roots, after the decayed parts of them are cut away, will do very well for forcing; especially when better plants cannot be conveniently had.

In places where few horses are kept, stable dung is scarce, but if there be forcing houses, an industrious gardener will endevour to

have forced asparagus without hot-beds. He substitutes a set of boxes three feet long and fourteen inches deep, and the same in width. These he half fills with a compost of rotten leaves, decayed dung, and light loam in equal parts. On this he places the roots as thickly together as he can, and then fills the boxes with the compost. The boxes are then placed over a flue or in any other place where they can have sufficient heat. Eighteen boxes form a set; six of which are taken into heat at a time.

Of the Leek, *(Allium porrum.)*—The leek is a very distinct species of the onion family, and a wholesome and useful culinary vegetable. The seed should be sown on a small seed-bed about the twentieth of March, and when arrived at the size of a swan's quill, they are fit to be transplanted into an open compartment. The ground intended to receive them should be rich or well manured, for on this the size of the full grown plant depends.

When the seedlings have acquired the proper size, and the ground is ready, they are dibbed by a line, in rows six inches apart, and allowing twelve inch intervals between the rows. As the weather is usually dry and warm at transplanting time, it is good management to dip the roots in a puddle of earth and water before planting, which facilitates their making fresh roots; and if, in addition, they each receive a little water, it will promote a renewed growth.

As the blanched stem of the plant is the most desirable part, the longer and larger this is, the more the leek is valued. But this part connot be lengthened by any mode of culture, because the leek, like the onion, is a surface rooting plant, and does not thrive if earthed up. A peculiar method of planting has, indeed, been recommended—namely, to make large and wide holes, with a large, bluff-pointed dibber, and then planting the leeks in the bottom of these holes. A narrow trench may answer the same purpose; but we never noticed the white part much lengthened by such means. The leeks may be used at any time, but they are chiefly in season during winter and spring. There are two sorts in cultivation—namely, the common and the London flag, somewhat different in form, but of exactly similar qualities.

Of the Onion *(Allium cepa.)*—This is one of our most common and most generally used vegetables as a salad, or for seasoning, either green or pickled. The onion is a biennial, and soon after midsummer makes, like some other bulbs, a pause in its growth, at which time they are usually taken up and stored for use. If sown late in the first summer thickly together, and on poor soil, their character may be changed from a biennial to a trennial; for if the small late sown onion be planted in the spring of the second year, they will very much increase in size of bulb, and not run to seed till the spring of the third year.

There are many varieties of the onion (vide lists in the Appendix) but the Dartford, Strasburg, and Spanish are the kinds mostly preferred for the principal crops, and the silver skinned for pick-

ling. The principal crops should be sown about the twentieth of March, on rich well digged ground. This is usually laid out into four feet wide beds with ten inch alleys between. The seed may be drilled or sown broad cast as regularly as possible, trodden in, covered with a little earth from the alleys, and then the whole raked smooth. In about three weeks the seedlings appear; and as they advance in growth they may stand too thick; in which case they may be gradually thinned for use until the principals stand four inches apart; the ground in the mean time being kept free from weeds and ocasionally stirred with a carrot hoe.

These principal crops arrive at full size about the first of August sooner or later, according to the heat and drought of the summer; for when dry and warm, onions soon bulb and cease growing; or if they be crowded, or grow on poor soil, the like effect takes place. In a dripping summer they continue to grow longer; and sometimes to check the growth the manager bends down the necks to cause the bulbs to ripen.

When the onion cease growing, they are pulled up and laid on a smooth cleared part of the surface for a week or two to dry and harden, and before being removed to the loft, they are trimmed of fibres and loose leaves; but the latter are left on, if the onions are intended to be platted into ropes for hanging up.

Besides the principal summer crop, other sowings are made in autumn—one in August and another in September; about the twenty-fifth of each month. The seed is sown exactly like the spring crops. The plants are arrested by the frost of winter though they are seldom totally killed. In spring they are thinned to four or five inch distances; the supernumeraries are used, or transplanted on fresh ground to bulb like those raised from seed. Many of the autumn sowings run to seed prematurely; but even these are useful in the kitchen; and those that do not run, attain to a good size.

As the onion is a surface-rooting plant it requires no earthing up; on the contrary, the largest bulbs are formed entirely on, or rather above the surface. And it further appears the soil they grow on should not only be very rich but very compact also. When onions are transplanted, therefore, their fibres only should be inserted in the soil, and that trodden very firmly round them.

When young onions of the smallest size are constantly wanted for salads, a small bed should be sown every month during the growing season.

OF SHALLOT, *(Allium ascalonium).*—This is a species of onion, of a peculiar habit of growth, of a more delicate flavour, and much used in superior cookery. It increases itself by offsets, and by which it is cultivated instead of by seeds. The smallest of these offsets or cloves as they are called, are planted in shallow drills either about the beginning of November or in February; and on rather a stiff soil, and open aspect. The cloves should have their bases

only pressed into the earth but not covered; and care must be taken that frost does not throw them out of their places before they get good hold of the soil. The twelve-inch space between the drills is occasionally hoed to kill the weeds; and when the leaves decay, the clustered bulbs are fit to pull; and are tied together by the leaves in bundles, and hung up in a shed to dry.

Of Garlic, *(Allium sativum)*.—This species of rank flavoured onion, is formed and cultivated exactly like the shallot; only as it is a stronger and taller growing plant, it requires wider spaces between plant and plant, as also between the rows. It is indispensable in high cookery; and is ready for storing when the leaves decay.

Of Rocambole, *(Allium scorodoprasum)*.—This rather curious plant, partakes of the general qualities of the genus; producing little bulbs instead of seed at the top of its stem, and also at the bottom like garlic, compared with which it is of a much milder flavour and used as an ingredient in made salads. The cloves are planted in drills six inches apart, in any of the spring months, and arrive at full growth in August. This plant is however not much cultivated.

Of the Potato Onion, *(Allium aggregatum)*.—A very prolific species of onion, yielding many large offsets instead of forming one large bulb. These offsets, approaching in size to that of a hen's egg, are equally useful as the common onion, though they do not keep so long. The smallest cloves should be planted one foot apart on the *shortest* day, and are ready to be gathered on the *longest*.

Of the Tree Onion, *(Allium canadensis)*.—It is a tall growing plant, and even requiring support. It produces small bulbs both at the bottom and at the top of the stem; the latter being preferred for pickling. The little bulbs may be planted either in the autumn or spring, the increase being ripe in summer.

Of Sea Kale, *(Crambe maritima)*.—This wild British plant is now universally cultivated as a table esculent. The seed are sown in drills on a bed intended to be permanant like those of asparagus; and when the seedlings are up they are thinned to eighteen inch distances, two or three plants being left at each station. The lightest sandy soil is the most suitable and when a garden contains nothing of the kind, an artificially made bed of leaf mould and sea, pit, or river sand should be prepared for the plants. Much depends on the quality of the soil for sea kale; it can hardly be too poor; if too rich the shoots are large, but the mild flavour is deteriorated. The bed or beds should be four feet wide, the plants occupying the middle from end to end. As already observed, the plants should stand in patches of three or four together for the convenience of forcing. During the first summer the plants only require to be kept free from weeds, and in this first season they

may be prompted into luxuriant growth by drenchings of manured water two or three times in the course of the summer.

In the autumn the dcayed leaves are cleeared, the bed pointed over and covered for the winter, with four inches of dry litter. In the spring the litter may be removed, and the crowns receive another covering of sand two inches thick. If any flower-stems rise in the succeeding summer, cut them down close, as they only exhaust the roots. Repeat the autumn management as above; and in the spring remove the winter covering of litter, point over the bed and lay over the crowns another inch of fine sand or gravel through which the shoots are intended to rise. The blanching pots or instead of them large flower pots, the hole in the bottom stopped with a cork, are now put over the patches of plants and pressed, close to the ground to exclude air and light. The pots are next surrounded and covered with hot stable dung which very soon excites the plants to throw up their shoots, which, when three or four inches high, are in perfection. The stools, if they continue to have hot dung applied when necessary—that is, to keep the heat within the pots at 56 or 58 of Fahrenheit's scale, will produce a succession of prime shoots for five or six weeks after heat is applied; but after that time the pots and dung must be cleared off, so that the plants may be fully exposed to the air and light to perfect their foliage and be recruited for the development of the next season.

The above detail shows how sea-kale may be forced in the spring; but it must be understood that the same process may be practised in any of the winter months; so that this vegetable may be brought to table at any time from the first of December to the end of April; which is accomplished by beginning to force four or five weeks before the crop is wanted.

There are several other plans for forcing sea-kale. Some plant the roots thickly together in large pots or boxes, which are placed in hot houses, closely covered by other pots or boxes, to exclude the light; and so situated, moderate crops are produced. Others again, particularly market-gardeners, raise great quantities on dung hot-beds in frames darkened by wooden shutters. Some grow it on a little heat in dark cellers, or in sheds behind hot-houses; and in the north of England it is succesfully grown in coal-mines by some of the industrious colliers!

As the stools have a tendency to rise from their first station or depth in the earth; it is customary at the autumn dressing to cut off all the crowns which have risen above the original surface of the bed; is order to keep the bed near the general level of the garden. New beds may easily be formed by one or two-year old seedlings or even with branches slipped form old established stools.

(To be continued.)

MEMOIRE ON THE STRAWBERRY.

Read before the Horticultural Society of Charleston, by the President, Judge WILLIAM JOHNSON in 1832.

[Published by request.]

As the season is now at hand which invites the attention of the horticulturist to his bed of Strawberries, I will solicit the attention of the Society while I submit a few remarks on this favored protegèe of our institution. The practical character of the body I have the honor to address, might excuse me in confining myself to the mere cultivation of this delightful fruit; but when gentlemen unite in associations for patriotic purposes, they may surely be indulged in sacrificing something to taste, and in blending the pursuit of the useful with the gratification of a laudable curiosity; or even in amusing speculation, as far as it contributes to furnish topics for literary inquiry or spirited conversation.

I shall not detain my auditors by an eulogy on the many excellencies of this admired fruit; the sense of this Society on the gratification it affords to the eye, to the smell, and to the taste, has been amply acknowledged by the effort we have made to render it like gold in the time of Solomon, as common in our markets as the stones in the streets.

A happy augury of ample success has already appeared in a spirited effort of one of that sex, who were born only to add to the cultivated taste and rational enjoyments of life; nor will the employment be deemed at all unappropriate when it is recollected that the fruit and the root furnish, the one an essence, the other a cosmetic, considered by the Parisian belle, as not unworthy of the charms which they contribute to embellish. And the time cannot be far distant, when the early production and cheapness of this article will impress on every mind, the propriety and duty of giving a preference in cultivating and improving our own native productions.

That the Strawberry is a native, and is susceptible of immense improvement from cultivation, are unquestionable facts. Scarcely is there a region between the Polar-circles where the foot of the early hunter may not chance to be stained by the juices of this dainty esculent. It is, however, true, that from the multitude of birds that feed upon it, from its ripening at the height of the time of ornithological emigration, and the inconceivable rapidity and length of the flight of some of the winged species, the fact of its extensive diffusion is not conclusive to prove either its general or even domestic origin, (for it may have been brought by the birds from Asia,) yet I will be indulged with a remark to shew, that we have no inconsiderable grounds of claim to the honor of having given it to the world; the best species known, America, if not Car-

olina, most certainly has introduced into Europe, to wit, the Scarlet, the Chilian, and Carolinian, and probably the Hautboy. I think it very questionable whether the Strawberry was at all known to the ancients. It is hardly possible to conceive that among a people so luxurious as the Romans, so devoted to the enjoyments of the table, and especially to those enjoyments which horticulture afforded; a people, who held the culture of the earth in such high honor, that the most distinguished of their statesmen and poets have left us instructions for cultivating a Leak or a Squash, a Plum or a Crab tree; a fruit so early, so fragrant, so fragrant, so beautiful, or so salubrious, as the Strawberry, should have escaped a passing notice in their books, or not have found a place on the farms in the vicinity of Rome, had it been known to them. Yet, in no one of their writers on geoponics have I been able to find a hint on its cultivation, nor even a name for it. It is true, that in our Latin Dictionaries we find the word *fragum*, and find it translated a Strawberry, and a derivation fancified for it, from the word *fragro*, in consequence of its flavor, or according to others *fragida*, and others *frango*, all, perhaps, of at least, questionable authority when referred to the general laws of etymology. And it is true, also, that from the term *fragum*, our botanists and cyclopedists have the word *fragaria*, the received name of the Strawberry; and of which it is said in Rees, and I think, in the French Encyclopedia of Knowledge, "that it was so called by the Romans on account of its fragrance:" but if the term *fragaria* is to be found in any Latin Dictionary, I am unacquainted with it. In Littleton and Ainsworth, it is not to be found, nor in any ancient author that I know of. The term *fragum* is to be found in one author, and I think the former is fully proved to be a modern substitute for it, by the fact of borrowing from Littleton the etymology assigned to it.

It is then only necessary to examine the word *fragum*, and to determine whether it was our Strawberry that was known to the ancients under that name. I think the evidence is full on the negative.

If the word fragum is to be found in Virgil, Cato, Varro, Paladius or Columella, it has escaped my eye. In Pliny's Natural History it is to be found; and in his Translator Holland, it is translated into English as the *Ground Strawberry*. But let Pliny speak for himself as to the description of fruit to which he applies that epithet. Every one knows that the *arbutus*, so frequently met with in our Latin books, is rendered by translators *the Stramberry Tree*. And the fruit of that tree is so proverbially harsh and uneatable, that it received, as Pliny says, the epithet *unedoni* from the impossibility of eating more than one at a time. Yet Pliny speaking of the *arbutus* and the *fragum*, and of the resemblance of their fruits, call them *congeners*. This is in the first instance of his mentioning the word *fragum*; but, as if to remove all doubt, he men-

tions it a second time, and then ranks it among plants "springing spontaneously and bearing *thorns* or *prickles*."*

It is hardly possible to avoid referring this description to the Blackberry, which its progress to maturity is red, and harsh enough to be well denominated a *congener* of the fruit of the *arbutus*. To these considerations it may be proper to add that the Greek word given by Littleton, and I think Ainsworth, for *fragum*, is that which the Lexicons give to the *arbutus*. *Fraga* is rendered *la Komara* in Hedericus, and *Komaros* the *arbutus*.

I have noticed the vast improvability of the Strawberry, as one among the many inducements to its cultivation. The full value of this characteristic is only known to those who have been engaged in improving it. The Chili Strawberry is in various writers represented as reaching to the wonderful size of a walnut or a hen's egg. I have myself witnessed facts sufficient to produce the strongest conviction, and most confident expectation on this subject. Strawberries, originally no larger than the end of one's finger, have, in my garden, in a few years, attained to treble that size. Three inches in circumference is of very common occurrence, three and a half very frequent, and in one instance, we measured one four and an half inches. Yet I know that my avocations have always disabled me from doing justice to the article. Perhaps, however, there is little to be gained from raising it beyond the circumference of three inches. At that size the plant bears abundantly and the fruit makes a fine exhibition on a table. The very largest would probably not bear so well, and would hardly ripen through before some bird or insect had inflicted a disfiguring wound upon an object so tempting and so conspicuous. Thus we are informed, that the great Chili is not a favorite among the gardeners of Europe, from its unproductiveness, while the early productive and brilliant Carolinian is much cultivated. Indeed, it would seem to have gained upon the Chili by cultivation, until it has either superseded it altogether in England, or to have substituted its name for the latter.†

It has been a subject of no little discussion among the learned, whether all the different species of Strawberry are any thing more than mere varieties. To vulgar senses, the form, color, growth and flavor of the fruit present sufficient characteristics to distinguish the kind and assign them their respective names; but the learned have been obliged to resort to the form, color, pubesence, and other circumstances of the leaf, the stock, &c. I have never cultivated but two kinds, and those are the two most familiar in our horticulture. The Hautboy which some think a native of Louisiana is one; and the other is one which, from having repeatedly found it in our native woods, I shall venture to call the real Carolina Strawberry.

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* Plin. Nat. His. ii. vol. pp. 206, 713.

† Fragaria Chiloensis, Rees.

The subjects to be considered by the cultivator naturally distribute themselves under the following heads.

1. Soil.
2. Time of planting.
3. Preparing your bed.
4. Setting out.
5. Dressing an old bed.
6. Care until the bearing season is over.
7. Care afterwards.

1. *Soil.*—In the choice of soil, the Strawberry appears to manifest no fastidiousness. We find it growing naturally in every description of soil, and surviving in despight of all kinds of neglect and rough treatment. The only exception that I know of is, that the water must not rest *on* or *in* the soil to which you consign it. Also, when growing in our gardens, in a sandy soil, unprotected from the summer's sun, it will perish, unless sufficiently watered. Yet I am inclined to think that in a natural state it affects a soil rather low and clayey. In glades and meadows, and particularly on the immense prairies of the western country, we find it flourishing, and bearing, and enduring in the highest degree for a state of nature; I have not had opportunities of observing, however, whether this may not be attributed to the protection which such places afford to its roots against the summer's sun, and the fires that annually pass over them. It is a common practice with many gardeners to strew their beds lightly with trash, and burn them off preparatory to dressing them; from perceiving, I presume, how the roots sprout and flourish in the meadows after the fire has cleaned them from the accumulations of grass and weeds which grew over them through the summer. But in a light soil and dry situation, I should think it a hazardous experiment. In a moist place or clayey soil, perhaps, it may be a safe as well as an expeditious method of clearing the plants of the dead leaves and accumulated trash of the past year. The soil of my garden was originally a very poor sand, full of nut-grass and very steril; by the aid of marsh-mud, stable manure, and compost, I have made it very productive in most kinds of vegetables; and such is the only soil on which I have cultivated the Strawberry. A rich sandy loam is what the foreign gardeners recommend, but I should say that the plant would succeed on any soil properly tempered to its habits, and I am well satisfied that in the efforts that are made to bring it to perfection, we oftener make the soil too rich, than leave it too poor. Hence so many beds disappoint the expectations of the zealous cultivator, by giving him abundance of large leaves but very little fruit. There is a medium which it is difficult to describe, but which seems indispensable to success with the Strawberry. A natural tact, or a few experiments will, however be sure to make us masters of it in a year or two.

2. *Time of planting.*—For the simple purpose of propagation, the Strawberry may be planted during a large portion of the year, perhaps in any month of the year, in our climate. But it will in summer, require careful watering. And if planted at any time before the first of February, it may produce fruit, but the time to which I have finally confined myself, is from the autumnal equinox to the tenth of October. During that period it takes readily, requires little, if any, watering after the first insertion of the plant, and bears a crop of good fruit the ensuing spring.

3. *Preparing your beds.*—Putting a bed in high tilth is a standing rule in horticulture whatever be the plant to be cultivated. This, therefore, I assume as having been done. Manuring is another standing rule, but in this instance it must be restricted by the suggestion before made, that a soil may be rendered too rich for Strawberries. It is impossible to lay down any precise rule on this subject, although an all-important consideration in the culture of this article. Much must depend upon the observation of the cultivator, and perhaps it may be enough here to say, and is certainly as much as one can venture to say, that land which will produce a crop of corn of twenty to twenty-five bushels to the acre, will produce a good crop of Strawberries.

Most persons are in the habit of making oblong beds of such a width as to admit of the gathering of the fruit from the paths on each side. And such is the mode recommended generally in the books. But I have long since abandoned it, and substituted another which I find more convenient. The size or proportion of my bed is immaterial; for I make small ridges upon it at from eighteen inches to two feet apart, on the summit of which I insert my plants in a single row. There is no loss of ground in this mode of planting, since, with beds at eighteen inches apart, and plants at eight inches distance on these beds or ridges, you have the same number of plants, as if set in the ordinary mode and twelve inches apart each way. The additional labor is trifling, and will be fully compensated by the increased facility in weeding, watering, gathering, and redressing. But the principal object in adopting this mode, is to keep the fruit the better off the ground. It is also a neater and more ornamental mode of cultivation, gives a better circulation of air, and your plants bear better and finer fruit when so arranged.

4. *Setting out.*—This is done by stretching a line along the summit of the ridge, and making holes along under the line with a trovel by an eight inch measure in a single row; after which, the plants must be watered the same day, and it would be advisable to repeat the watering, if the weather is dry. A little attention to watering at this time will save the necessity of replenishing, when, perhaps, your plants have been hoed up or given away, or the season too far advanced for the sets to take good root before the severe colds, or to produce a satisfactory crop in the spring.

It is hardly necessary to add (for no horticulturist should be suspected of slovenly habits) that the sides of the ridges should be neatly raked and levelled, after the planting is completed.

5. *Dressing an old bed.*—The books generally maintained that a Strawberry-bed should be renewed every three years. I shall have occasion before I conclude, to consider the question whether it would not be the best economy to renew it every year. But in order to give an option to the horticulturist, I will suggest a method of dressing an old bed, which renders it unnecessary to abandon it at all, and which is necessary to be attended to every year if you would have regular beds and good fruit.

The first week in October, and after filling up the new beds from the select succours of the old, you stretch a line along the summit of the ridge, and draw up a little earth so as to restore the regularity of its form whenever it has been impaired by the rains and other causes between the season of bearing, and that of dressing. You then select young plants from your runners, and replenish the summit of the ridge under or near your line, where the plants have failed, (as many of them always will fail from the ants, the sun, and a worm that sometimes attacks the roots.) When that is done, hoe clean between the ridges, and turn up the ground about half a spade deep.

It may be that the bed needs manuring; for either the plant or the exposure of the soil to the sun, produced in cultivating it, certainly does weaken the soil. This is always perceived by the pale hue and stinted growth of the plant, and in that case manure must be scattered before the spading is given to it.

After this dressing, as you can have easy access to every part, care must be taken to eradicate the weeds and nut-grass; for the true reason why the breaking up of the old beds becomes necessary is, that they get foul and exhausted. By pursuing the method here suggested and drawing up the manured soil to the roots of the plant, I have kept the same bed clean, full, and in heart for ten years, and it may be kept as many more.

6. *Care until the bearing season is over.*—In common with all other plants, the Strawberry beds must be kept clean from grass and weeds, the surface occasionally stirred and the earth lightly replaced to the roots. The attention peculiar to the plant consists only in taking off the runners. The mode of doing this I consider all-important to successful cultivation, for the fibre is strong, and whenever jerked off by the hand, the root of the plant is shaken, its tender shoots broken, and its growth always impeded, often entirely put an end to. I hold it to be indispensable, that the runners should be clipped off by scissors, or cut with a sharp instrument. The most simple and expeditious mode is, by fixing the blade of the knife, or something of the kind, obliquely on the end of a short staff so as to it in a standing posture, and with an oblique cut. This I have always found most difficult to get our slaves to perform as it

ought to be done, but it must be enforced, or you will find your bed unequal in growth, and uncertain in production.

We find the name of *Strawberry* attributed in the books to the practice, said to be prevalent among European gardeners, of raising the fruit from the ground by adjusting straw to the root. In our sandy soil, I am fully sensible of the benefits to be derived from the practice, for the fruit becomes gritty, covered with earth, and of an earthly flavor often, when in contact with the soil. Besides which, worms, that never quit the earth, often attack it in that situation, and destroy it wholly or partially. But the trouble and difficulty of procuring the straw proper for the purpose have prevented me heretofore from resorting to the practice. This year, however, an experiment to determine how close the *holcus sorgum* (Geinea corn,) may be planted in drills, to be productive, has put me in possession of an article, and a fact that will enable me to avail myself of this improvement. Thus planted, the holcus produces an abundance of straight, slender, tall and durable stocks, and yet, abundantly rewards the cultivator with its grain. These stocks will answer admirably to be applied on both sides of the plant, and can easily be sustained in their places by pins, until the bearing season is over. I anticipate a great improvement from it, and every garden can advantageously cultivate a sufficient quantity for its own use.

7. *Care necessary after the bearing season is over.*—Those who hear me, if any have never cultivated this plant, will, perhaps, be surprised to know that this is the most troublesome part of the year in cultivating the Strawberry; or at least, that part of the year in which it is most difficult to know what is to be done. From the month of October to the month of June, the beds are kept clear by comparatively small labor, and so far it is an article of very easy cultivation. But from that time, to keep the beds clean and the runners in check, require no little labor, and is always attended with this danger, that by keeping the earth exposed to the sun, the soil is impoverished, and the roots exposed to be killed by the heat; an evil which, if the summer is not more rainy than ordinary, will often extend to your whole bed, unless prevented by shade or irrigation. And on the other hand, if you suffer the grass and runner to grow, the grass, if your land is at all in heart, will be apt to kill down every plant and leave you a very feeble stand, if any thing, when you have cleaned up your beds. Indeed, in extracting the roots of our crab-grass, every Strawberry root that remains, if alive, will be so shaken as to endanger its existence, or render it very feeble, besides destroying all your suckers. The great risk of losing even my plants from these causes, induced me to plant peach trees over one of my beds, and these or any other deciduous trees will in a great measure, protect the plants in summer without shading them too much in winter. But, otherwise,

we must submit to the labor of keeping clean and watering liberally.

These facts have raised in my mind the doubt whether it would not be good economy to make new beds annually, and only preserve as much of the old as will supply an abundance of plants. It is true, this will be injurious both to the uniform quality and quantity of the fruit. But it will be a saving in labor and care; quantity may easily be supplied by extending the planting, and, if the beds be planted by the first week in October, in a soil of a suitable fertility, the quality of the fruit will be very respectable. I would not be understood as recommending this alternative, but only as submitting it to the consideration of the experimenter. It will, however, be always prudent, and such is said to be the practice of the European gardeners, to have a nursery of plants in a shaded spot, or one of a northern aspect, and even then, not to neglect irrigation. For want of attention to this precaution, I have known sundry individuals who had to depend annually on their neighbors for plants, whereas, a prudent manager will always have them to give away, if ever he has once fairly embarked in the cultivation of this article.

Upon the whole, I will conclude with this remark, that success in raising the Strawberry will depend mainly upon—1st, establishing and dressing your beds in the proper season. 2d, Producing the proper medium of fertility in the soil. 3d, Taking away the runners without shaking the roots. 4th, Keeping your beds in good heart and clean; and 5th, Watering and shading without stint when the season requires it, and, lastly, in never crowding your plants unreasonably, for in this instance, may the farmers rule most emphatically be applied, "that the half is worth more than the whole."

THE ORCHARD.

For the Southern Agriculturist.

FRUIT TREES.

It is stated in Pinkerton's Tour that the Russians succeed in preserving fruit trees of a delicate kind, which otherwise could not live in their severe climate, by permitting the roots to grow only on one side, which enables them to lay the trees down in autumn, and cover them with straw and earth till spring, when they are again raised and staked. The trees which he saw were growing freely, and bearing a fair appearance for a good crop.

The fact may prove an useful note to the remarks on the Fig Tree, in the Feb. No. 1841, of the Southern Agriculturist. B.

NEW MODE OF GRAFTING.

Mr. Downing, of Newberg, has lately practiced with success, a new mode of grafting, the object being to test the quality of fruits raised from seeds, in a shorter period than would be possible by permitting such seedlings to stand until time of bearing.

The method is, to put the top of a shoot from a seedling tree, or a new variety, when it is desirable to procure a specimen immediately, upon the top of thrifty shoot of a middle-aged fruit-bearing tree; the process being simply to take thrifty shoots, about a quarter of an inch in diameter, and cut them in a slanting manner clear through, so as to detach about four inches of the top from the rest, making the line of the angle about an inch—the stock being cut in the same manner. The backs are to be then carefully united, and bound with yarn, covering the whole with grafting wax to exclude the air. By this mode, fruit may be obtained in a short time, so as to test its value at an early day, the operation being simply with scarcely a fear of failure.

MISCELLANEOUS.

From the [London] Magazine of Domestic Economy.

DOMESTIC PICKLING.

The art of pickling seems universally propagated among us, yet few are able to produce good and wholesome pickles. The most poisonous materials are used with a recklessness that can arise only from the extreme simplicity of ignorance. It is frightful to contemplate the means by which the lives of the Queen's subjects are placed in jeopardy by the old customs and prejudices, attached to the art of preserving with vinegar certain substances used in the preparation of our food. There is an immense quantity of pickles consumed in England by all classes; and from this consumption arise a great many acute distempers, which are never imputed to the right cause: the action upon the stomach of the metallic oxides produced by the solvent energy of the vinegar upon the metal vessels in which the pickles are manufactured.

Pickles properly prepared and quite free from any chemical compounds of which ignorance might have unwittingly allowed the introduction, are generally wholesome, and agree with most constitutions when used with discretion. And so strange are the laws which direct the chemical laboratory of the human stomach, that pickles made with vinegar have been known, in some dyspeptic idiosyncrasies, to stop acetous fermentation actually in action in the stomach at the time they were taken.

The vessels most commonly used for pickling are made of copper, brass, or bell-metal; but of the first more usually; these vessels, say our "professed cooks," and domestic pickle-makers, giving them a good colour. A good colour indeed! this is, with a vengeance, the *posito pavone* of Horace, or the poisonous anotto colouring of the Gloucester cheese-makers—appearance being much more attended to than flavour or salubrity. This "good colour," as it is called, proceeds from acetate of copper, a most deadly poison, produced by the vinegar acting upon and dissolving the copper of which the vessel is made. Sometimes these pickling syrens, luring but to destroy, produce pickles of a beautiful green colour, by boiling a couple of half-pence in the vinegar. The effect would be exactly the same, attended with the same consequences, if they added a little verdigrease instead of the half-pence. A copper vessel tinned is also very injurious; because the tin used for this purpose contains a quantity of lead. This being dissolved by the vinegar yields acetate of lead, which in the stomach is converted into carbonate of lead, and produces that dreadful and fatal disease termed painter's colic. Pure tin is also dangerous, because, according to the best mineralogical chemists, it contains a certain portion of arsenic, which, like the tin, is acted upon by the vinegar.

The only safe vessels to use for boiling vinegar and for pickling are iron, and stone. Any oxidation arising from the action of vinegar upon an iron vessel, would be but slight, and even if it were greater, would have no injurious effect. Pipkins should never be used, because their glaze, which is very poisonous, is dissolved by the vinegar. There is a recent invention on the continent for pickling vessels, which, if adopted in this country, would prove a great saving of health. The vessel is made of cast-iron, with a lining of thick glass. As the liquid is in the vessel, and the glass heats gradually, it does not crack. Stewpans of the same description have been introduced into some kitchens at Paris, with a lining of porcelain instead of glass, this perhaps being cheaper and preferable for cooking.

In manufacturing pickles for sale, much importance is given to their having a good colour; and copper vessels are always used, as well to produce this effect, as because they are the most convenient, or in the technical phrase, "the most handy." It would be too much trouble for an oilman, who manufactures pickles for sale on a very extensive scale, to attend to minute points that did not concern his own personal comfort. His father prepared pickles so before him, and nobody complained, and why should he make any alteration? And thus is the public health sacrificed to minister to the idleness, ignorance, and spirit of gain, of a puddling-headed tradesman, who will thrust his hands into his breeches pockets and say with true John Bull arrogance, "I pay my way, therefore I shall do as I please. If you do not like my pickles you may leave them. Poison or not poison, there are others who will buy them;

and depend upon it, I shall not leave off using my coppers to please you or any one else." Does not this call for legislative interference? Are the lives of human beings to be thus trifled with? But what can be expected when, for the advantage of a few, who have *influence* enough to *influence* the legislature, Smithfield market is still allowed to exist, and the lives and limbs of every wayfarer in this metropolis endangered by droves of cattle driven through the streets; when, likewise for the interests of a few, slaughter-houses and triperies are allowed to send forth, from all parts of London, fetid exhalations that undermine the health of its inhabitants; and when, in this age of knowledge, human bodies are allowed to be buried in the very heart of this populous city, in church-yards already bursting with their dead, teeming with the seeds of pestilence, and spreading disease and death around the neighbourhood. What, I say, can be expected under such circumstances? Why, that we are to continue till better times to be poisoned, trodden down by cattle, and have perpetual visitations of pestilence, by virtue of "prescriptive right."

If pickles in any shop-window have a very green appearance, avoid them if you would preserve your health; for you cannot be sure that the colour has not been obtained by the presence of copper in the vinegar. And of this you may be almost certain, that every jar or bottle of pickles you see exposed for sale, has been manufactured by means of metal vessels—indeed you may safely say of copper. Until the present mode of pickling be altered, never buy them; if every one would come to this determination, the system would be altered, and the pickle-maker would soon close-reef the topsails of his arrogance.

The object of this present paper is to give a few instructions whereby families either in London or in the country may prepare good and relishing pickles without their containing anything to injure the health. It may also, perchance, be found that many among our receipts are quite new.

In a former paper on cookery we gave directions for making a curry, finding, at the same time, great fault with the various (so called) curry powders used in this country. Shortly after, a correspondent complained that we had offered no substitute for the bad curry powder, by giving directions how to make better. This omission we supply, curry being so closely connected with pickle, that, in India, they are never or scarcely ever, eaten separately. We therefore begin with the curry powder, after which we shall offer some receipts for making different kinds of vinegar.

Curry Powder.—Dry well a quarter of a pound of cardamom seeds and the same quantity of coriander seeds. Beat or grind them together to an impalpable powder. Dry and reduce also to an impalpable powder an ounce of caraway seeds, an ounce and half of tumeric, and two ounces of black pepper. Mix this latter

powder with the former, both having first been carefully sifted, and all that does not pass being again ground. Now add half an ounce of the best powdered ginger, and a large nutmeg, grated. Put the powder into a closely-stopped bottle for use. When you make a curry, add either of green chili bruised with salt, or of cayenne pepper, the first in preference, as much as you think requisite to impart to the curry the heat you desire. The mild curry should be made with the powder alone, quite free from any addition of either chili or cayenne pepper.

(To be continued.)

PICKLES.

Artichokes.—Scrape them, and throw them into water until all are scraped: take them all out and pack them in a jar, or other vessel, in fine salt, and let them stand 24 or 36 hours, then take them out, expose them to the sun for one or two days, wash them in vinegar, and then put them into fresh vinegar to remain.

Mangoes or Melons, are to be cut in half, and then treated in the same manner.

Bell-peppers.—Cut holes into them, and if it is desired that they should not be hot, take out the seeds, pour boiling water upon them, and let them remain until the water is cold—then take them out, pack in salt, dry and put into vinegar as above. Mustard-seeds, spices, &c., can be added to suit the taste.

Shrimps.—Break off all the heads, and put them into a dish to be kept; then peel the shrimps, and throw them into the jar. Pound the heads, pour some of the vinegar over them, and strain it through a towel or coarse cloth, and pour it upon the shrimps, and if it is not enough, pour more upon the heads and treat as before, until you have enough. The shrimps should not be packed in the jar, but thrown in loosely, and not too many. If at any time the vinegar should ferment, it should be poured off and fresh substituted. The vinegar cannot be too strong, and if very strong cannot be procured, I would recommend that acetic acid, diluted with *three* times its quantity of soft water, be used as far preferable in every respect. The vinegar may be flavoured either by adding the spices, pepper, &c., and heating them together over a slow fire *without boiling*, or by macerating them together cold for a week or two previous. Vinegar should never be boiled, for I would as soon think of boiling Brandy to strengthen it as vinegar. Turk's Island salt only should ever be used for preserving pickles, meats, or butter, as the Liverpool salt will not answer.

TO CURE BACON.

MAKE a mixture of the following preparations: 1 ounce saltpetre pounded fine; 1 lb. of brown sugar; and 1 quart of Turk's Island salt pounded fine, and well mixed together. If the weather is very cold, rub your meat well with this mixture as soon as you can cut it up; but if it is mild or warm, allow your meat to get thoroughly cooled before rubbing it. Put the pieces in a hogshead or barrel with holes bored in the bottom, or with an open false bottom, or what is better, upon a sloping shelf or dresser, and allow it to drip--rub and hang up to smoke as usual.

To cure Beef, use a pint of molasses instead of the pound of sugar, and pack away close, so that the meat shall make its own pickle if possible, but if it will not, add a pickle made of the above preparation and water boiled together. Beef thus prepared, will keep sweet and tender as long as it lasts. I have kept beef thus prepared in the winter until near autumn, without its spoiling or becoming hard.

NEW METHOD OF MAKING CHEESE.

We have lately seen a method of making cheese, which is worthy of being tested by experiment at this season of the year, especially by those who have but a small quantity of milk. It is very simple and easily tried. The milk is SET in the ordinary way every morning, and the curd separated from the whey as well as can be with the hands. It is then pressed compactly into the bottom of an earthen pot, and covered over with several folds of dry linen, or cotten cloth. By this process the remaining whey is absorbed, and when the cloth becomes saturated it is removed and a dry one placed in its stead. In the course of the day and night this process removes the whey as thoroughly as it can be done by pressing. The next morning the milk is prepared in the same manner, and the curd packed closely upon the top of that prepared the day previous, and the same method pursued in separating the moisture. This process is repeated until you have a *cream pot full of cheese*. It is thus seen to be a convenient method where the dairy woman has the milk of but one or two cows. If it work well, it is an important discovery. If it fail, it need not be a very disastrious failure. It is a very succesful way of preserving the cheese from flies and mice, as it can be perfectly enclosed and kept from such gentry, and from the air and light. We have seen but one experiment of this kind, and this promises to be a successful one. The cheese appeared as free from moisture, and as solid as that made by the press.—The labor is much less, and the care of it afterwards is comparatively nothing. P.

CURIOUS ARTS.

Some friend has sent us through the post office, the following useful recipes, which if genuine—and we see no reason to doubt—are truly valuable, as well as curious. He has our thanks.

1. *A Water proof Glue.*—Melt common glue in the smallest possible quantity of water, and add by drops linseed oil that has been rendered *drying* by having a small quantity of litharge boiled in it; the glue being briskly stirred when the oil is added.

2. Glue will resist water to a considerable extent by being dissolved in skimmed milk.

3. The addition of finely levigated chalk to a solution of common glue in water, strengthens it, and renders it suitable for signs or other work that is exposed to the weather.

4. A glue (or cement) that will hold against fire or water, may be made by mixing and boiling together linseed oil and quick lime. This mixture must be reduced to the consistence of soft putty and then spread on tin plates and dried in the shade, where it will dry very hard. This may afterwards be melted like common glue, and must be used while hot. [*American Mechanic.*

ENGRAFTING-WAX.

An experience man at the business of engrafting, objects to the use of *rosin* or any other similar substance in his engrafting-wax: such substances burn or heat too much. Two parts of bees-wax and one of tallow makes his wax. While this is in a melted state he dips cheap tape into it and then winds the tape into balls. With this tape thus greased, he binds in his scions; with his composition he fills the cleft in the centre of the stock, and all places where the air or water could gain admission. When a stock is large, he binds around it a wide strip of woollen cloth, so that it shall extend about an inch above the stock and forms a dish or cup, which he fills with earth. He never puts scions in water. When a scion has been cut off at the top, he puts wax on the top.

From the Temperance Advocate.

PRACTICE OF ECONOMY.

Mr. Editor,—"The hardness of the times" has not only induced the study, but the practice of every means of economy possible, on our plantations—and there are so many palpable omissions of this sort, I beg your attention to a few of the most prominent.

Nothing is more common, than that of planters persuading themselves, "that it is cheaper to buy their mules, horses, meat, negro shoes, negro clothing, flour, rice, and some go so far, as exclusively to make cotton and buy corn.

In hunting applications for these extremes, I know of no planter buying *none* of these articles, who is not prosperous, on the contrary, although good crops may be made, complaint is made of an inconsiderable nett income.

It has been repeatedly urged upon our planters, and fortunately concurred in, that to make a large cotton crop on our present exhausted soils, we must raise stock, to afford extensive facilities for making manure. In addition, when a planter determines and *prepares* to make all these things, there is such an inseparable link that the expense in raising mules, meat and wool, is trifling, and the other items proposed, are alike consequent.

I have no hesitancy in concurring in the policy of British husbandry, "to keep but few cattle, and many sheep," but very few are required to furnish hides to make our negro shoes; and the old primitive custom of tanning in a trough, is so simple and economical, as not to require a remark—and in concluding this part, any ordinary field hand can make two pair of shoes a day, with but little instruction.

On a plantation with fifty hands, the same number of sheep is sufficient to furnish wool for clothing; and one hand, with the assistance of a spinning machine, can spin and weave their clothing, between laying by and planting time—only the loss of one entire hand, 30 days of another, in gathering the crop, which would not be observed.

About two or three acres of wheat, well manured, and prepared, is sufficient for flour, and but a spot for rice.

In these enumerations, I take it for granted, every planter has his blacksmith and carpenter, which almost completes the items of expense on a farm, with the exception of bagging. This is an important item, which cannot be improved upon, by the effort of *any one planter, or any single State*, but with the concurrence of the whole of our cotten growing States, a policy could be adopted productive of incalculable advantage to each individual.

We pay 26 cents for hemp bagging, when as good an article can be made of cotton for 20 cents per yard, at even 12½ cents per lb. for the cotton—but this price *must be secured*, and not subjected to the fluctuation, from 26 to 14 cents. as hemp bagging is, as this, with the difference of *weight* given to the bale by the *hemp*, has produced an abortive in the single effort made by Dr. Fisher, a partial and perhaps an entire set off might be made to this, by using frost-bitten cotton or stained cotton.

Looking, however, to *general* and *not particular* results, in such calculations, the increased consumption of cotton, hereby effected, would be such an acquisition, as to remove, not only the exception of difference of weight in the comparative bales, the fluctuations of price in hemp bagging, but the uniform increase in consumption, would furnish a more stable price in *cotton itself*. Farther, in this substitution the main sustenance of profit to the *hemp grower*,

(bagging,) being destroyed, its cultivation for finer fabrics would not be justified, and cotton again substituted.

As the calculation can only be realized by legislative concert, I hope it may be at no remote period acted upon, as its importance require. In haste, J. B. D.

[*Temperance Advocate.*

A VALUABLE TABLE.

THE following valuable table was calculated by James M. Garnett, Esq. of Essex County, Va., and first published in Mr. Ruffin's Farmer's Register:

Table.—A box 24 inches by 16 inches square and 28 inches deep, will contain a barrel, or 10,752 cubic inches.

A box 24 by 16 inches square and 14 inches deep, will contain a half barrel, or 5,376 cubic inches.

A box 16 inches by 16 8-10 inches square, and 8 inches deep, will contain a bushel, or 2,150 4-10 cubic inches.

A box 12 by 11 2-10 inches square and 8 inches deep, will contain half a bushel, or 1,075 2-10 cubic inches.

A box 8 inches by 8 4-10 inches square and 8 inches deep, will contain one peck, or 537 6-10 cubic inches.

A box 8 inches square and 4 2-10 inches deep, will contain one-half peck, or 263 8-10 cubic inches.

A box 8 inches square and 4 8-10 inches deep, will contain half a gallon, or 131 4-10 cubic inches.

A box 4 inches square and 4 2-10 inches deep, will contain one quart, or 67 2-10 cubic inches.

These measures come within a small fraction of a cubic inch of being perfectly accurate, as near indeed as any measures of capacity have ever yet been made for common use; the difficulty of making them with absolute exactness has never yet been overcome.

GARDENER'S CALENDAR FOR MAY.

VEGETABLE GARDEN.

Sow cabbages, savoys, carrots, beets, turnips, cauliflowers, brocoli, celery, radishes. Plant snap beans. Transplant cabbages. Prick out celery.

Remarks.—There is not much probability of either beets, parsnips, carrots, or turnips, succeeding at this season, especially the last, yet if wanted, a few may be ventured—under very favorable circumstances they may succeed. If carrots be sown, the ground should be shaded and kept moist, and this protection continued to the young plants and sometime after they are up, or they will be killed by the hot sun.—*Miller's Planter's and Merchant's Almanac for* 1842.

CORRECTION.

THE article on New Dahlias in our last number, p. 219, should have been credited to THE MAGAZINE OF HORTICULTURE.—The credit was given to us by the printer, which we did not observe in time to correct.—[ED. SO. AGR.

Agricultural and Horticultural REPOSITORY.

NO. 81 EAST-BAY, CHARLESTON, (SO. CA.)

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GARDEN AND FIELD SEEDS.

THE SUBSCRIBER *has received his Full supply of GARDEN and FIELD SEEDS, consisting of all the varieties enumerated below, and several others which are new. Among them the highly prized WHITE BELGIAN CARROT, which unites the flavor of the Carrot and Parsnip, (for an account of which see current vol. So. Agr., p 411.) Also, WINTER RYE, said to be equal for pasturage to the Carolina Rye; and SEED BARLEY.*

Twenty-five varieties of PEAS, among which are Cedo Nulli, Extra Early Dwarf, Early Warwick, Knight's Marrowfat, Blue Scymetar, Dwarf Sugar of Holland, Spanish Marrow; and all of the old varieties.

BEANS—nineteen varieties, among which are Dutch Dwarf, Davenport, China, Royal Dwarf, Horticultural, &c. &c.

BEETS—eight varieties, consisting of Early Turnip (red and yellow,) Long Blood, Yellow Castelnanderry, Red do., Silesia or Sugar, &c. &c.

CABBAGES—twenty-nine varieties, among which are Early Paris Superfine, Nonpareil, Hope, Vanack, Early York, Ox heart (large and small,) Battersea, St. Dennis, Early Dutch, Large do., Large Pancallier Savoy of Tours, Monstrous French Savoy, &c. &c.

BROCOLI—three varieties.

CAULIFLOWERS—six varieties, viz.: Tender or Spring, Half-hardy for autumn, Hardy of Paris, Dutch Hardy, Early and Late.

CARROTS—nine varieties. PARSNIPS—two varieties CELERY—seven varieties. CRESS—three varieties LETTUCE—nine varieties. CUCUMBER—four varieties. SQUASHES—seven varieties. MELONS *Musk*—nineteen superior varieties *from France*, embracing the Honfleur, Canteleups, Sugar, Persian, Winter, and many others in high estimation. Also, six varieties of American. WATER-MELONS—three varieties. KOHL RABBI—four varieties.

Together with many new and superior varieties of VEGETABLES not enumerated above, for which we refer to our printed catalogue.

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His STOCK OF IMPLEMENTS has been considerably increased, and embraces a larger variety than has ever been offered in this market. His PLOUGHS are from the most celebrated makers of New-England, and have taken numerous premiums; in addition to which, he has all of the MORE COMMON KINDS, and can accommodate his customers with Ploughs from $3 to $12, according to size and quality. He has also a LARGE ASSORTMENT OF STRAW-CUTTERS and CORN-SHELLERS, with EVERY OTHER IMPLEMENT REQUIRED on the FARM or PLANTATION.

Printed Catalogues will tebe furnished gratis on application (*post paid,*) and all Orders promptly executed. SEEDS and IMPLEMENTS carefully packed and sent by Steam-boat Rail-road, to any part of this State, North-Carolina or Georgia.

November 4th, 1841. J. D. LEGARE.

CHEMICAL ANALYSIS OF SOILS,

MARLS, LIMESTONES, MINERAL WATERS, AND ORES GENERALLY.

PROF. SHEPARD of the South Carolina Medical College, begs leave to inform the public that he has fitted up a department in his Laboratory expressly or the performance of the above mentioned undertaking: and that all commissions of this nature, with which he may be favored, will receive his prompt, personal attention.

Address Prof. C. U. SHEPARD, Medical College, Charleston.

☞ The following payments have been received for the *Southern Agriculturist*:—Wm. Heyward, Esqr., J, H. Couper, Esqr., Col. Thomas Pinckney.

ON OLD ACCOUNT.—Estate of W. A. Mikell, J. C. Abercrombie.

OUR PATRONS, are respectfully reminded that the payment of their dues will be very acceptable these "*hard times.*"

NOTICE.

The Subscriber finding it inconvenient to attend to any other than the Editorial duties, requests that all letters on business be directed to the Publisher of this Journal, Mr. A. E. Miller, who will also attend to all the business transactions relating to the Southern Cabinet or Southern Agriculturist.

Dec. 3*d*, 1841. J. D. LEGARE.

BERKSHIRE PIGS.

THE SUBSCRIBER still continues to improve his superior breed of BERKSHIRE SWINE, by crossing with the best imported stock in the country. He has now on hand several very fine litters, and can supply those who wish to purchase, at $20 cash per pair, two months old, delivered on board of any vessel in New York, free of charge. Many of his stock have been sent to several distinguished agriculturists in South Carolina, and have given universal satisfaction.

WM. B. PARSONS.

Flushing, (Long Island,) Dec. 18, 1841. 3

BOOK-BINDING.

BINDING OF THE AGRICULTURIST AND OTHER BOOKS will be done neatly, and cheap, if sent to the office of the Publisher. Missing numbers furnished. WILLIAM ESTILL, Binder.